MOTOROLA
MOTOMESH DUO 2.0
4300 Users Guide

July 2007

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Chapter

1

Chapter 1: Product Introduction

This guide will provide you with technical specifications, installation guidelines, and testing procedures for the MOTOMESH Duo 4300 infrastructure devices.

Figure 1-1 MOTOMESH Duo 4300 Device Attached to a Light Pole

Infrastructure Devices

The MOTOMESH DUO 4300 device is configured to operate as an Intelligent Access Point (IAP) from the factory. The device is capable of being configured to operate as either an IAP or a MWR (Mesh Wireless Router). The selection of an IAP or MWR configuration will be determined by the customer's wireless network needs at the time of purchase.

When the MOTOMESH Duo 4300 device is configured to operate as an IAP, it acts as the transition point from the wireless network to the wired core network and from there, through media gateways, out to the Internet. When the MOTOMESH Duo 4300 device is configured to operate as a MWR, it behaves as a wireless device that is primarily deployed to seed and extend the range between IAPs and Wireless Clients while simultaneously increasing the spectral efficiency of the network. While running as a MWR device, the device's Ethernet connector can be utilized to connect to another IP-enabled device. This allows a network of IP-enabled devices (such as a camera) to be directly addressed, accessed and managed over the MOTOMESH network.

IAP functionality includes:

- Transition Point between the wired and wireless network
- Dynamic Route Selection

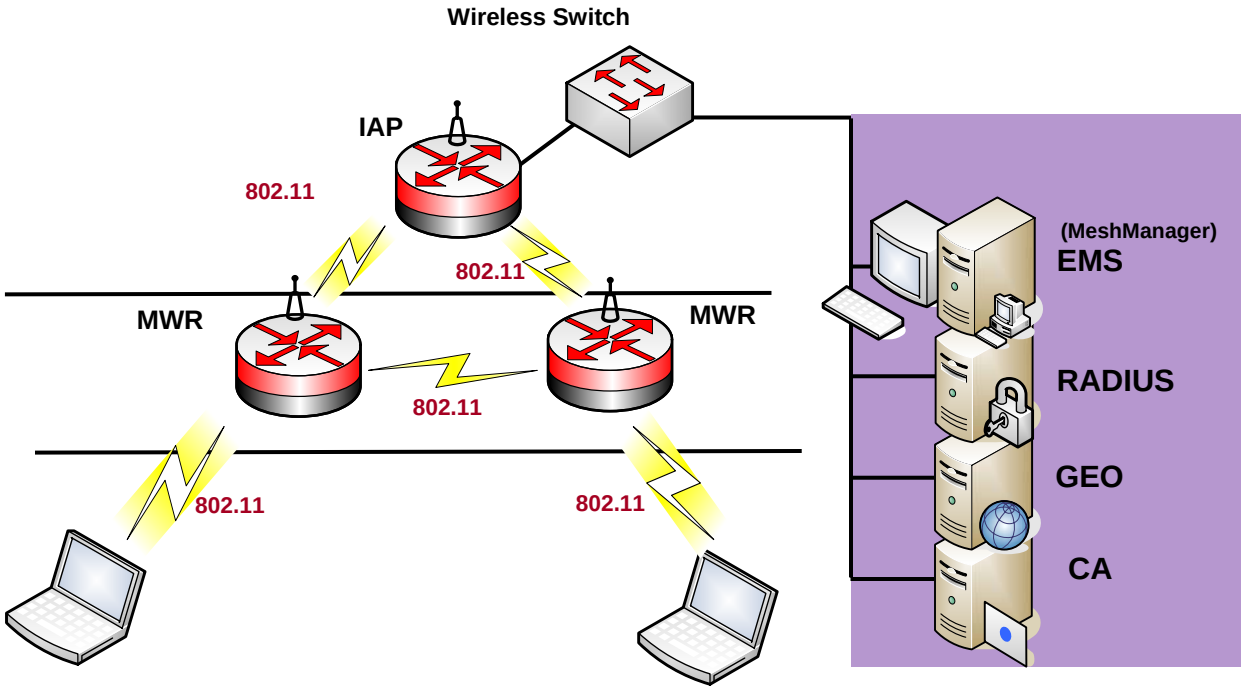
MWR functionality includes:

- Dynamic Route Selection
- Range Extension for all other network devices

Infrastructure Devices within a MOTOMESH Wireless Network

A MOTOMESH Duo 4300 device is considered a fixed **Infrastructure** device that can be configured to operate as either an IAP (Intelligent Access Point) or a MWR (Mesh Wireless Router) within the MOTOMESH Wireless Network. Infrastructure devices provide area coverage access for wireless clients to the wired network.

Figure 1-2 IAP and MWR Devices in Context of a MOTOMESH Network



MOTOMESH Duo 4300 Device Specifications

The following specification tables apply to the MOTOMESH Duo 4300-49, 4300-58, and 4300-54 Infrastructure Devices.

Table 1-1 MOTOMESH Duo 4300-49 Device Specifications

Radio Characteristics		
Primary Radio Operating Freq. (GHz)	2.400 to 2.483	
Secondary Radio Operating Freq. (GHz)	4.940 to 4.990	
Wi-Fi Support	802.11b/g at 2.4GHz; 802.11a at 4.9GHz	
RF Modulation	CCK (802.11b) / OFDM (802.11a/g)	
	2.4 GHz Portion	**4.9 GHz Portion**
Transmit Power (Maximum)	35 dBm EIRP	34 dBm EIRP
Receive Sensitivity	801.11b: -92 dBm (at 11 Mbps) to -100 dBm (at 1 Mbps) 801.11g: -78 dBm (at 54 Mbps) to -95 dBm (at 6 Mbps)	802.11a: -77 dBm (at 27 Mbps) to -93 dBm (at 3 Mbps)
Power Control	1dB increments	
Antenna Type	Two (2) omni directional, 8 dBi (for 2.4 GHz Radio) and 11 dBi (for 4.9 GHz Radio)	
Antenna Connector	N-Type	
Routing		
Routing Engine	MeshConnex™ Layer 2 routing with Layer 1 situational-awareness	
Routing Protocol	Patented, hybrid proactive/reactive routing (low latency & fast route convergence)	
IEEE 802.11s Support	Upgradeable to IEEE 802.11s standard via OTA software updates	
Network		
Network Management Software	MeshManager Element Management System via secure SNMP v.3	
Network Interface	10/100Mbps Ethernet (RJ-45) port with surge suppression	
Network Segmentation	Multiple SSIDs with VLAN mapping	
Quality of Service (QoS)	802.11e, EDCF, 802.11p and the IP precedence of DSCP (ToS) bits	
Security		
Virtual LAN (VLAN)	Supports up to sixteen (16) per node, or 4094 per network	
Client Encryption Support	WEP, WPA (TKIP) and WPA2 (AES, 802.11i)	
Internodal Encryption	Intra-Mesh Security	
Authentication	802.1X (Infrastructure/Client) and MAC address hardware authentication	

Power	
Power Input	90-264 VAC (with +/- 20% variation at 47 to 63 Hz) 12V +/- 10% VDC input, certified LPS power supply (orderable option)
Power Connector	AC power cord, 12 ft
Power Consumption	15W (with both radios operating) 22.2W (with Canopy® Connect PoE operational) 29.4W (with IEEE 802.3af Standard PoE device)
Power over Ethernet (PoE)	Canopy and IEEE 802.3af support available
Physical	
Dimensions	9”x 6”x 3.5” (23.1cm x 15.2cm x 8.9cm)
Weight	4.5 lbs (2.04kg)
Packaging	Outdoor, all-weather enclosure (NEMA 4)
Mounting	3” (7.62cm) diameter post mounting
Environment	
Temperature Range	-30 to +60 °C
Humidity	0 to 95%, non-condensing
Certifications	FCC Part 15 & 90, UL, CSA
Available Options	
Mounting	Lamp post mount bracket assembly
Power	AC photo cell adapter

Table 1-2 MOTOMESH Duo 4300-58 Device Specifications

Radio Characteristics		
Primary Radio Operating Freq. (GHz)	2.400 to 2.483	
Secondary Radio Operating Freq. (GHz)	5.725 to 5.825	
Wi-Fi Support	802.11b/g at 2.4GHz; 802.11a at 5.8GHz	
RF Modulation	CCK (802.11b) / OFDM (802.11a/g)	
	2.4 GHz Portion	**5.8 GHz Portion**
Transmit Power (Maximum)	35 dBm EIRP	34 dBm EIRP
Receive Sensitivity	801.11b: -92 dBm (at 11 Mbps) to -100 dBm (at 1 Mbps) 801.11g: -78 dBm (at 54 Mbps) to -95 dBm (at 6 Mbps)	802.11a: -77 dBm (at 54 Mbps) to -93 dBm (at 6 Mbps)
Power Control	1dB increments	

Antenna Type	Two (2) omni directional, 8 dBi (for 2.4 GHz Radio) and 10 dBi (for 5.8 GHz Radio)
Antenna Connector	N-Type
Routing	
Routing Engine	MeshConnex Layer 2 routing with Layer 1 situational-awareness
Routing Protocol	Patented, hybrid proactive/reactive routing (low latency & fast route convergence)
IEEE 802.11s Support	Upgradeable to IEEE 802.11s standard via OTA software updates
Network	
Network Management Software	MeshManager Element Management System via secure SNMP v.3
Network Interface	10/100Mbps Ethernet (RJ-45) port with surge suppression
Network Segmentation	Multiple SSIDs with VLAN mapping
Quality of Service (QoS)	802.11e, EDCF, 802.11p and the IP precedence of DSCP (ToS) bits
Security	
Virtual LAN (VLAN)	Supports up to sixteen (16) per node, or 4094 per network
Client Encryption Support	WEP, WPA (TKIP) and WPA2 (AES, 802.11i)
Internodal Encryption	Intra-Mesh Security
Authentication	802.1X (Infrastructure/Client) and MAC address hardware authentication
Power	
Power Requirements	90-264 VAC (with +/- 20% variation at 47 to 63 Hz) 12V +/- 10% VDC input, certified LPS power supply (orderable option)
Power Connector	AC power cord, 12 ft
Power Consumption	15W (with both radios operating) 22.2W (with Canopy® Connect PoE operational) 29.4W (with IEEE 802.3af Standard PoE device)
Power over Ethernet (PoE)	Canopy and IEEE 802.3af support available
Physical	
Dimensions	9”x 6”x 3.5” (23.1cm x 15.2cm x 8.9cm)
Weight	4.5 lbs (2.04kg)
Packaging	Outdoor, all-weather enclosure (NEMA 4)
Mounting	3" (7.62cm) diameter post mounting
Environment	
Temperature Range	-30 to +60 °C
Humidity	0 to 95%, non-condensing
Certifications	FCC Part 15 & 90, UL, CSA

Available Options	
Mounting	Lamp post mount bracket assembly
Power	AC photo cell adapter

Table 1-3 MOTOMESH Duo 4300-54 Device Specifications

Radio Characteristics		
Primary Radio Operating Freq. (GHz)	2.400 to 2.483	
Secondary Radio Operating Freq. (GHz)	5.470 to 5.725	
Wi-Fi Support	802.11b/g at 2.4GHz; 802.11a at 5.4GHz	
RF Modulation	CCK (802.11b) / OFDM (802.11a/g)	
	2.4 GHz Portion	**5.4 GHz Portion**
Output Power (Maximum)	35 dBm EIRP	34 dBm EIRP
Receive Sensitivity	801.11b: -92 dBm (at 11 Mbps) to -100 dBm (at 1 Mbps) 801.11g: -78 dBm (at 54 Mbps) to -95 dBm (at 6 Mbps)	802.11a: -77 dBm (at 54 Mbps) to -93 dBm (at 6 Mbps)
Power Control	1dB increments	
Antenna Type	Two (2) omni directional, 8 dBi (for 2.4 GHz Radio) and 10 dBi (for 5.4 GHz Radio)	
Antenna Connector	N-Type	
Routing		
Routing Engine	MeshConnex Layer 2 routing with Layer 1 situational-awareness	
Routing Protocol	Patented, hybrid proactive/reactive routing (low latency & fast route convergence)	
IEEE 802.11s Support	Upgradeable to IEEE 802.11s standard via OTA software updates	
Network		
Network Management Software	MeshManager Element Management System via secure SNMP v.3	
Network Interface	10/100Mbps Ethernet (RJ-45) port with surge suppression	
Network Segmentation	Multiple SSIDs with VLAN mapping	
Quality of Service (QoS)	802.11e, EDCF, 802.11p and the IP precedence of DSCP (ToS) bits	
Security		
Virtual LAN (VLAN)	Supports up to sixteen (16) per node, or 4094 per network	
Client Encryption Support	WEP, WPA (TKIP) and WPA2 (AES, 802.11i)	
Internodal Encryption	Intra-Mesh Security	
Authentication	802.1X (Infrastructure/Client) and MAC address hardware authentication	

Power	
Power Requirements	90-264 VAC (with variation at 47 to 63 Hz) 12V +/- 10% VDC input, certified LPS power supply (orderable option)
Power Connector	AC power cord, 12 ft
Power Consumption	15W (with both radios operating at 50% duty cycle)
Power over Ethernet (PoE)	Support for Canopy PoE connection
Physical	
Dimensions	9”x 6”x 3.5” (23.1cm x 15.2cm x 8.9cm)
Weight	4.5 lbs (2.04kg)
Packaging	Outdoor, all-weather enclosure (NEMA 4)
Mounting	3" (7.62cm) diameter post mounting
Environment	
Temperature Range	-30 to +60 °C
Humidity	0 to 95%, non-condensing
Certifications	FCC Part 15 & 90, UL, CSA
Available Options	
Mounting	Lamp post mount bracket assembly
Power	AC photo cell adapter

Chapter

2

Chapter 2: Infrastructure Device Installation

This chapter will provide hardware and software installation information for the MOTOMESH DUO 4300 Infrastructure Device.

Software Requirements

The MOTOMESH DUO 4300 infrastructure devices can be setup and configured using the **MeshManager Element Management System** (EMS) or the **Web Interface** utility.

MeshManager EMS

MeshManager EMS is used for device setup, configuration, and management of MOTOMESH infrastructure devices. Prior to using the MeshManager software for device installation and configuration, ensure that it is installed and running on a network computer. MeshManager will be used during the device setup process to validate the installation of the device(s) as well as manage, within the wireless network.

Detailed information about the MeshManager application is found in the *MeshManager Users Guide*.

IMPORTANT

If you are using MeshManager to manage your network, there are some additional guidelines to be observed when using the Web Interface.

1. When using the following MeshManager elements:
   - VAP Manager
   - VLAN Manager
   - Security Manager

DO NOT use the Web Interface to manage VAP, VLAN, or Security configurations.

2. If a device has already been added to the network using MeshManager, **DO NOT** use the Web Interface to change the device type from an IAP to an MWR or from an MWR to an IAP.
3. If you use the Web Interface to **restore the factory defaults** for the device, you must first delete the device and add it again using MeshManager so that the device type will be properly identified in the database.

Web Interface Utility

Initial configuration and management of MOTOMESH infrastructure devices can also carried out using the Web Interface utility. The Web Interface application is designed to support the setup and configuration of smaller MOTOMESH networks. It can be used as an alternative to the MeshManager during the initial setup and configuration of MOTOMESH infrastructure devices. The application uses standard elements of a Web-based interface to allow the user to configure the basic parameters of seven primary network management elements required to successfully deploy a MOTOMESH network using the navigation menu displayed on each page.

Detailed information about the Web Interface utility can be found in the *Web Interface Users Guide*.

Hardware Installation Notes

For a MOTOMESH deployment, a permanent power source for each MOTOMESH Duo 4300 device must be provided. All infrastructure devices require professional installation to ensure that the installation is performed in accordance with FCC licensing regulations

Infrastructure devices are fitted with a single pivot mounting bracket designed to be attached to light poles and other probable installation sites. Alternate mounting hardware is available for mounting directly to posts or structures that are too large for the standard bracket. Optional remote antenna mount hardware is also available for use with the alternate mounting hardware.

Ports and Connections

The following list defines the standard ports and connections for the MOTOMESH Duo 4300 device running in either the IAP or MWR modes.

- **100-240V** A/C Power Cable with flying leads
- One **non Power over Ethernet (PoE)** Ethernet port
- One **Power over Ethernet (PoE)** capable port supporting:
  - Canopy Connect PoE
  - Standards based 802.3af PoE

IAPs can be pre-configured to use Canopy Connect PoE or 802.11 Standards Based PoE or with POE Disabled.

- Optional External Personality Plug to activate power over Ethernet Motorola Canopy ™ PoE or standards based 802.3af PoE.
- Mounting Bracket

Operator Supply List

The Network Operator must supply the following equipment:

- Mounting Location
- Power Source (100-240 VAC depending on IAP configuration)
- Ethernet connection between the IAP and MiSC.

Optional Antennas

The following antennas are recommended for use with Infrastructure Devices.

Table 2-1 Recommended Antennas for Infrastructure Devices

Manufacturer	Part Number	Gain	Usage
Radiall-Larsen	R380.700.212	10 dBi	5.8 GHz Infrastructure
Radiall-Larsen	R380.500.227	11 dBi	4.9 GHz Infrastructure

MOTOMESH DUO Infrastructure Device Labels

The MAC address for each device is recorded on a label located on the device enclosure. Record this number in the provided ***IAP or MWR*** MAC Address Table section. The MAC Addresses will be required later to configure and test the device.

Figure 2-1 MOTOMESH DUO 4300 - 49 AC and DC Device Product Labels (Samples)

MOTOROLA
MOTOMESH Duo 4300 - 49
This device complies with Part 15 & 90 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
Protected by U.S. & International Patents • INPUT: 90-264 VAC @ 47-63 Hz • 45 Watts
Contains Transmitter Module – FCC ID: QJE-MM4300-49 • IC: 4602A-MM430049
MOTOROLA
MOTOMESH Duo 4300 - 49 DC
This device complies with Part 15 & 90 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
Protected by U.S. & International Patents • INPUT: 12VDC +/- 10% • 30 Watts
Contains Transmitter Module – FCC ID: QJE-MM4300-49 • IC: 4602A-MM430049

Figure 2-2 MOTOMESH DUO 4300 - 58 AC and DC Device Product Labels (Samples)

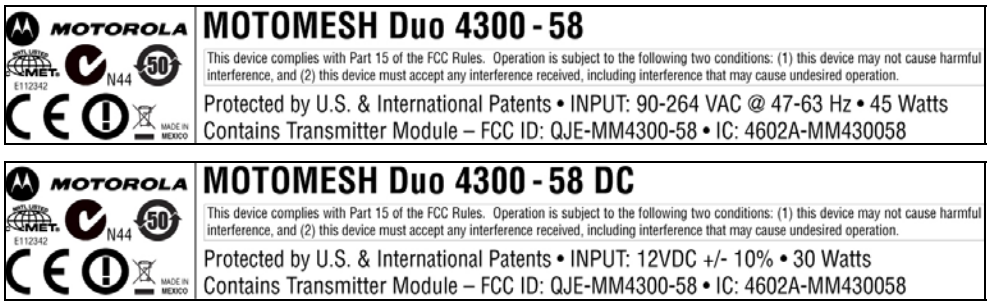

MOTOROLA
MOTOMESH Duo 4300 - 58
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
Protected by U.S. & International Patents • INPUT: 90-264 VAC @ 47-63 Hz • 45 Watts
Contains Transmitter Module – FCC ID: QJE-MM4300-58 • IC: 4602A-MM430058
MOTOROLA
MOTOMESH Duo 4300 - 58 DC
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
Protected by U.S. & International Patents • INPUT: 12VDC +/- 10% • 30 Watts
Contains Transmitter Module – FCC ID: QJE-MM4300-58 • IC: 4602A-MM430058

Figure 2-3 MOTOMESH DUO 4300 - 54 AC and DC Device Product Label (Samples for European Use only)

MOTOROLA
MOTOMESH Duo 4300 - 54
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
Protected by U.S. & International Patents • INPUT: 90-264 VAC @ 47-63 Hz • 45 Watts
MOTOROLA
MOTOMESH Duo 4300 - 54 DC
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
Protected by U.S. & International Patents • INPUT: 12VDC +/- 10% • 30 Watts

Infrastructure Device MAC Address Table

Table 2-2 MAC Address Table

IAP or MWR	Device Name	Ethernet MAC IP Address

Infrastructure Device Assembly

Figure 2-4 shows the external connection points for a MOTOMESH Duo 4300 device. The figure below it shows some examples of optional personality plugs (Black – Canopy Connect PoE, and Standards based 802.3 af PoE Grey). A red Hardware Reset Plug (not shown below) is also available and is used to reset a stranded 4300 device back to its factory default configuration.

Figure 2-4 Infrastructure Device Top View showing External Connection Points

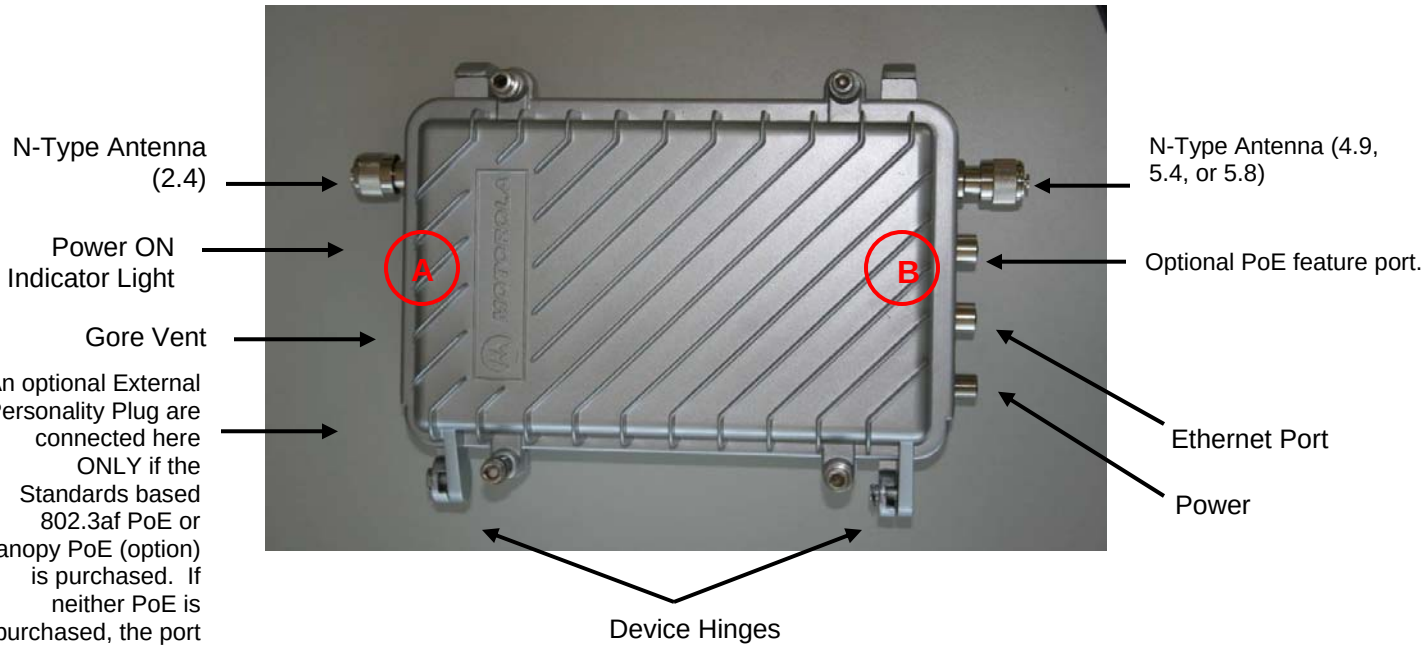
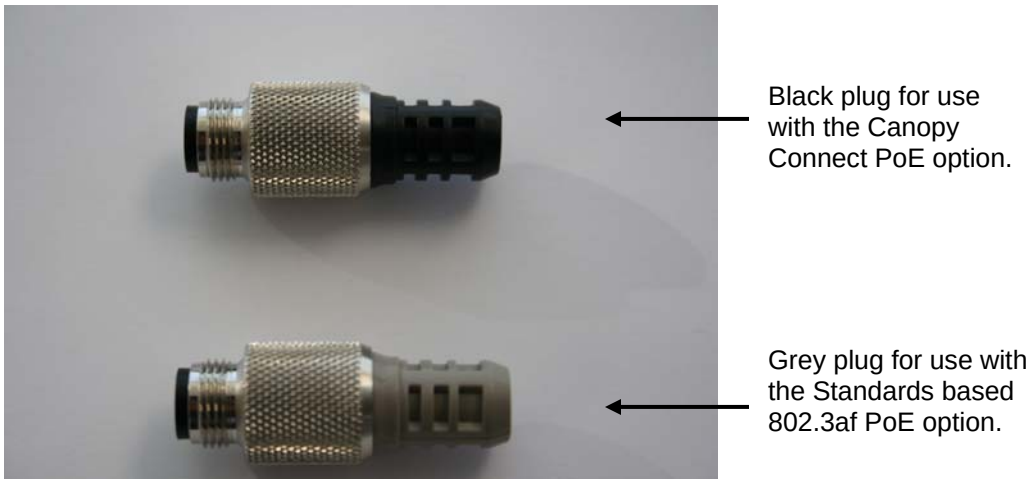

N-Type Antenna (2.4)
Power ON Indicator Light
Gore Vent
An optional External Personality Plug are connected here ONLY if the Standards based 802.3af PoE or Canopy PoE (option) is purchased. If neither PoE is purchased, the port will be covered.
A
B
N-Type Antenna (4.9, 5.4, or 5.8)
Optional PoE feature port.
Ethernet Port
Power
Device Hinges

Figure 2-5 External Personality Plugs (Black, Grey, Red, or none)



NOTE: An optional red Hardware Reset Plug (not shown above) is used to reset a stranded 4300 device back to its factory default configuration. The plug looks similar to the other Personality Plugs shown above, but it is in red.

Figure 2-6 Side View (B) of the 4300 Device's External Connection Points

MOTOROLA
MOTOMESH Duo 4300 - 58
Protected by U.S. & International Patents • INPUT: 90-264 VAC @ 47-63 Hz • 45 Watts
Contains Transmitter Module – FCC ID: QJE-MM4300-58 • IC: 4602A-MM430058
PWR
ETH
POE OPT
5.8 GHz

Figure 2-7 Side View (A) of the 4300 Device's External Connection Points

Personality Plug Port showing an attached **Canopy Connect** plug. (Black)

Infrastructure Device Deployment and Installation

MOTOMESH devices require professional installation to ensure that the installation is performed in accordance with Motorola installation standards**.** All common precautions for grounding and electrostatic discharge protection should be observed during deployment and installation.

CAUTION

To eliminate risk of electric shock, DO NOT connect/disconnect cables while units are energized.

Observe the following additional guidelines when deploying fixed Infrastructure devices:

- The MOTOMESH Duo 4300 device may be mounted on a pole having a diameter of 1-3.5 inches, utilizing the provided brackets.

- The antenna must have a separation distance of at least 2 meters from the body of all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.
- Users and installers must be provided with antenna installation and transmitter operating conditions to satisfy RF exposure compliance.
- When deploying the MOTOMESH Duo 4300 device, the antenna(s) should be a minimum of 30 inches from any nearby metal poles to avoid distortion of the RF pattern.
- The installation location must provide power to the MOTOMESH DUO 4300 Device.
- It is the responsibility of the Network Operator to ensure that the installation complies with any local building codes and permits.

Grounding Considerations

In order for a grounding system to be effective, a low impedance path to earth ground must be present. The grounding system must have conductors of sufficient size to withstand the high fault currents that must be shunted along this path. The lower the impedance the grounding system displays, the better its capability to perform its task. The impedance requirement for a communications site is determined by the classification of the site. Sites are broken down into 2 categories: Type A-Light Duty and Type B-Light Industrial/Commercial. Type A-Light Duty sites have impedance requirements of 25 ohms or less to ground whereas Type B- Light Industrial/Commercial sites have impedance requirements of less than 5 ohms to ground. MOTOMESH networks fall into the Type B-Light Industrial/Commercial category, and therefore must be treated with greater considerations as far as grounding requirements are concerned.

Since Type B grounding requirements stipulate 5 ohms or less impedance to earth ground, things such as soil pH, type of grounding rods, size of conductors, and ground enhancing materials must be taken into account to achieve this goal. To verify the impedance requirements are met, a special Earth/Ground Resistance Tester (megohmmeter) may be necessary.

- If the MOTOMESH product is attached to a light arm and the attachment point meets the Type B grounding requirements, then the grounding stud attachment point is not required to be used.

WARNING

To avoid damage to the equipment, adequate grounding for all MOTOMESH devices is mandatory.

Assembling an AC Power MOTOMESH Duo Device

Use the following procedure to assemble a MOTOMESH Duo Device with AC power.

Procedure 2-1 Assembling an AC Power MOTOMESH Duo Device

1	Place the brackets at the desired position on the pole.

2	Adjust the position of the box so that the antenna connecters are positioned vertically. Align the antennas with the N-type connectors on the box and rotate to close.
3	Insert the cable into the external Ethernet port and tighten the connector to ensure a weatherproof seal.
4	Insert the Power Plug into the 4-pin connector.

Assembling a DC Power MOTOMESH Duo Device

Use the following procedure to assemble a MOTOMESH Duo Device with DC power.

Procedure 2-2 Assembling a DC MOTOMESH Duo Device

1	Place the brackets at the desired position on the pole.
2	Adjust the position of the box so that the antenna connecters are positioned vertically. Align the antennas with the N-type connectors on the box and rotate to close.
3	Insert the cable into the external Ethernet port and tighten the connector to ensure a weatherproof seal.
4	Identify a certified LPS power supply capable of 12V +/- 10% VDC. Using the custom power cable provided, connect the **Red** wire to power and the **White** wire to ground. If a power source chassis ground is available, connect the **Green** wire to the chassis ground.

Device Connectivity Testing

Only *after* a MiSC has been setup on the network, and an infrastructure device has been added using the MeshManager, element management system software, that the procedure below can be used to verify connectivity to a device.

Procedure 2-3 Testing Infrastructure Device Connectivity

1	Apply power to the device, the device should be operation in 60 to 120 seconds
2	Obtain the 802.11 MAC addresses for the device subcomponents that were recorded in the MAC Address Table earlier in this manual. The address will be in the following format: xx-xx-xx-xx-xx-xx.
3	Within MeshManager's Device Manager screen, right-click on the appropriate IAP or MWR device in the Device Tree and select the **Ping Device** option.
4	Check for a successful response to the **Ping** command in the *Named Device* results dialog box. A successful response to the ping commands verifies connectivity to the device (IAP or MWR).
5	Repeat steps 1-4 for additional IAP or MWR devices.

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Chapter

3

Chapter 3: Device Configuration

This chapter includes the following sections:

- Pre-staging a MOTOMESH Duo 4300 device in MeshManager
- Demoting and Promoting an IAP
- Second IP Stack Aids in Troubleshooting

Pre-staging a MOTOMESH Duo 4300 Device in MeshManager

Default Device Configuration

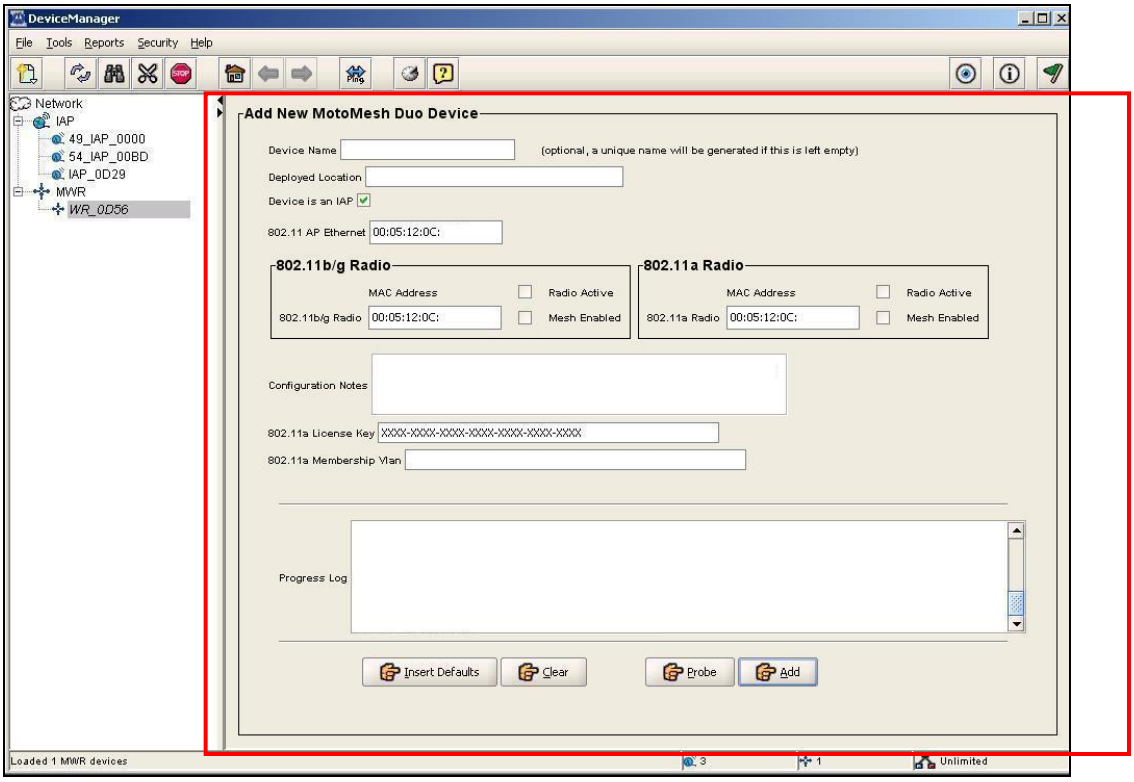
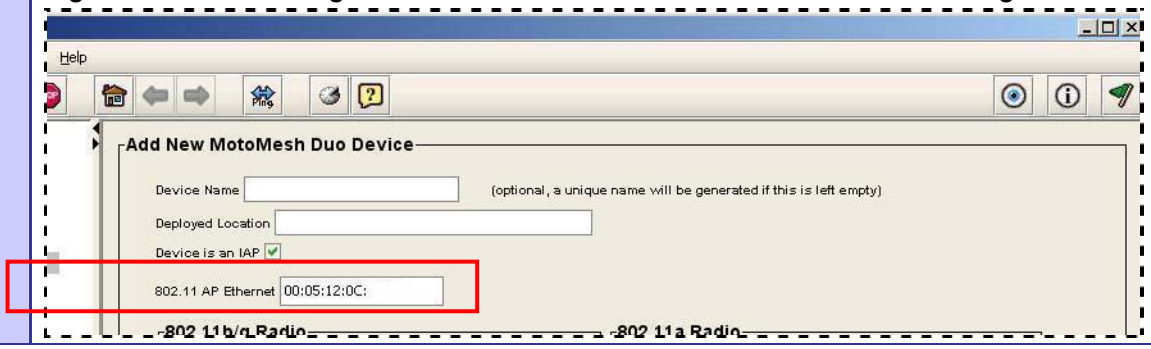
The following is a description of default configurations for a Motorola 4300-54, and 4300-58 device:

- 2.4 GHz radio is pre-configured (any other frequency is not automatically enabled, even if purchased.) The following sections will describe how to enable the additional radio and network mesh.
- Management VLAN is set at 4095
- VLAN Membership is set at 0-4095

Configuring a 4300 Device Mesh from 2.4 to 4.9, 5.4, or 5.8

The following procedure describes the necessary steps required to change an out-of-the-box device from an *802.11 b/g* mesh to an *802.11 a* mesh with the use of the MOTOMESH Duo 2.0 MeshManager element management system application (also known as DeviceManager) prior to field deployment.

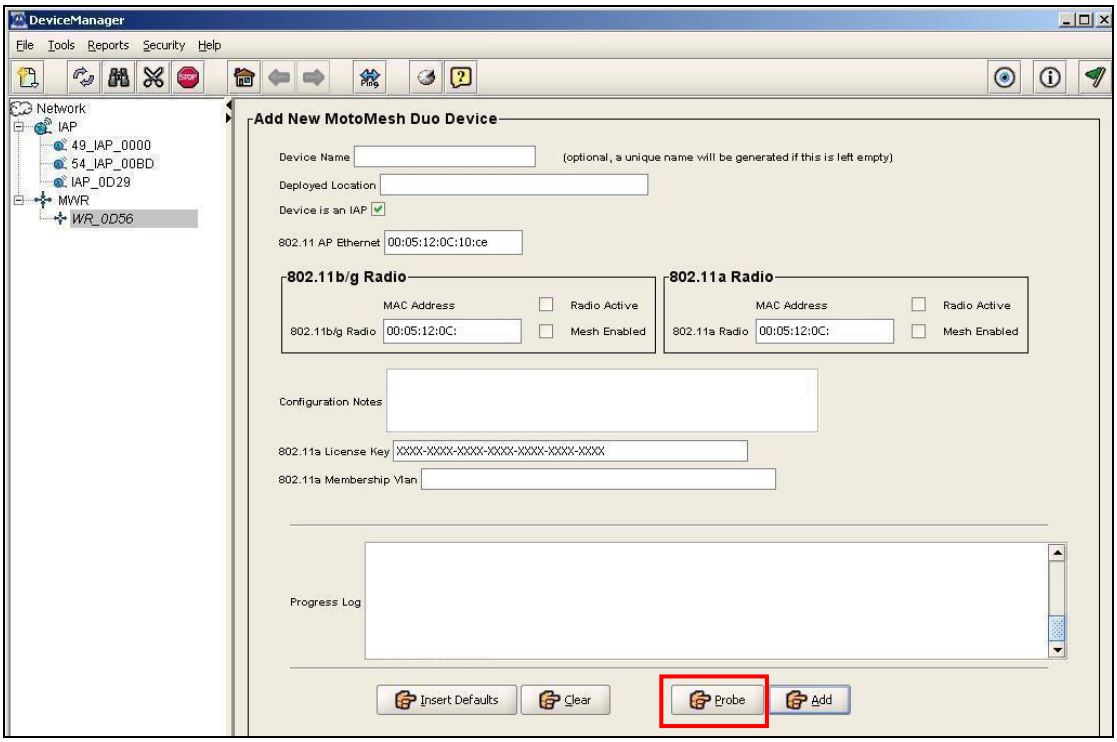
Procedure 3-1 Configuring a 4300 Device Mesh

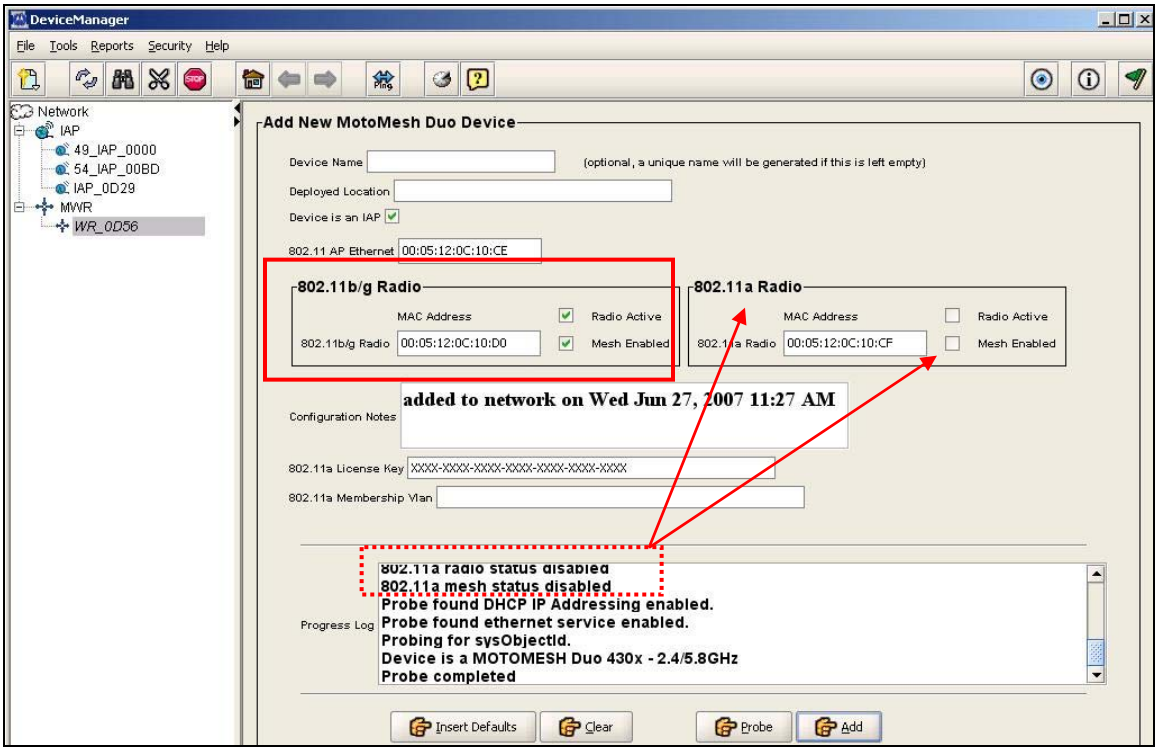
1	Ensure that all the 4300 devices are wire-connected to the MOTOMESH 2.0 MiSC. **NOTE**: It is recommended that the 4300 devices are set-up on the *bench* prior to actual deployment in the field.
2	The MOTOMESH 2.0 MeshManager element management application must be installed and running.
3	From within MeshManager select the **Add MotoMesh Duo Device** icon from the Toolbar menu, or select **File | Add MotoMesh Duo Device** from the application menu.
4	The **Add New MOTOMESH Duo Device** panel will now be shown in MeshManager. **Figure 3-1 The Add New MOTOMESH Duo Device Panel in MeshManager** 
5	Enter the 4300 Device's 802.11 Ethernet MAC address, from the external device's label, into the **802.11 AP Ethernet** entry field. **Figure 3-2 Entering the 802.11 AP Ethernet MAC Address in MeshManager** 

6 Select the **Probe** button after entering the device's Ethernet MAC address.

The *probing* operation will ensure that the device is communicating with the MiSC in addition to capturing the other MAC Addresses.

Figure 3-3 Selecting the Probe Button in MeshManager



7	Note that after initial *Probing* during the *Add New Device* process, the **802.11 b/g** Radio and Mesh are **both** ENABLED by default, and the **802.11 a** Radio and Mesh are both DISABLED by default. **Figure 3-4 Examining Initial Device Defaults in MeshManager** 
8	To configure an 802.11 b/g mesh network, a license key is not required. The only necessary steps are (1) **Probe** device, (2) configure **Device Name** and **Location**, and (3) select the **Add** button to finalize the configuration. DO NOT enter any License Key or Membership VLAN information.

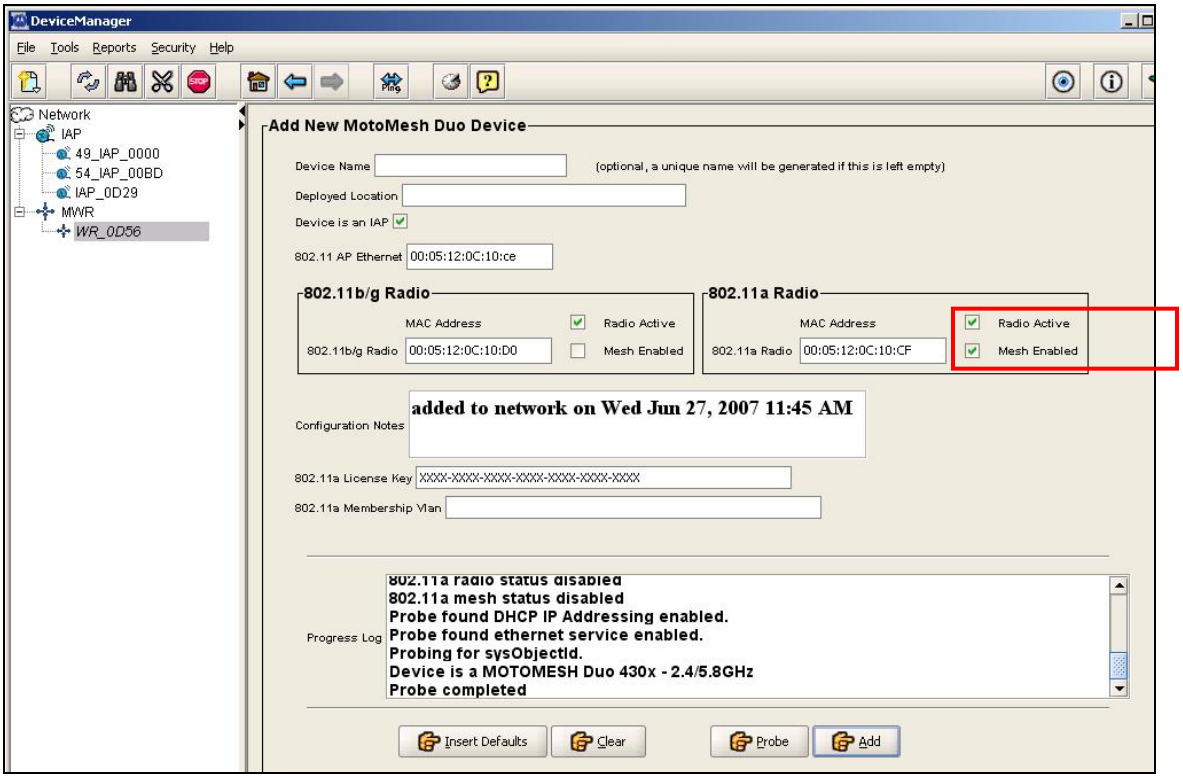
9

To enable the **802.11 a** Radio and Mesh devices (4300-54 and 4300-58). Select the 802.11 a Radio **Active** check box AND the **Mesh Enabled** check box.

NOTE: Selecting the 802.11 a Radio and Mesh check boxes will automatically cause the **802.11 b/g Radio** checkbox to remain enabled while the **Mesh Enabled** checkbox will be de-selected.

IMPORTANT NOTE: Only one mesh can be active when setting up 2.4/5.4 and 2.4/5.8 devices. However, when setting 2.4/4.9 devices, both meshes will be activated.

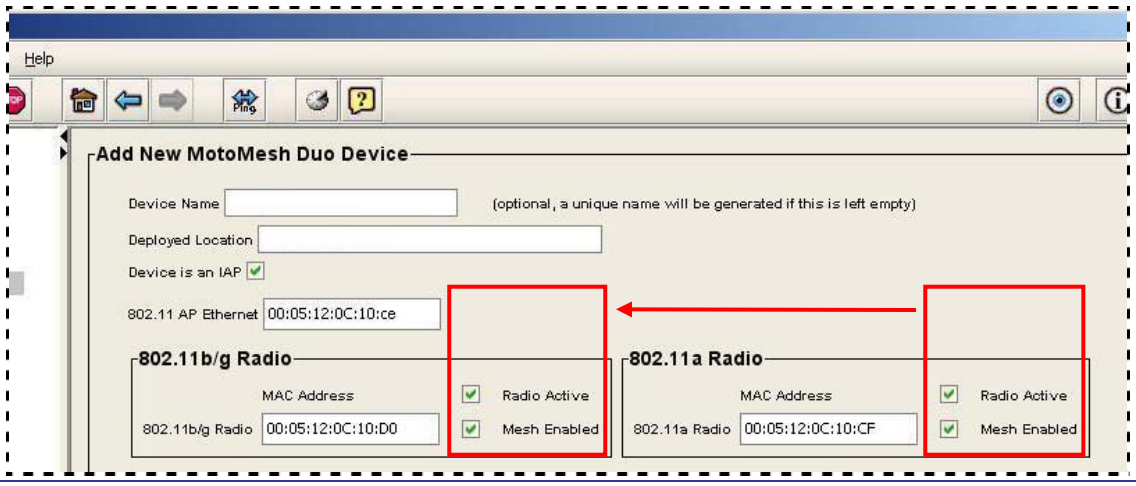
Figure 3-5 Enabling the *802.11 a* Radio on a 4300-54 and 4300-58 Device

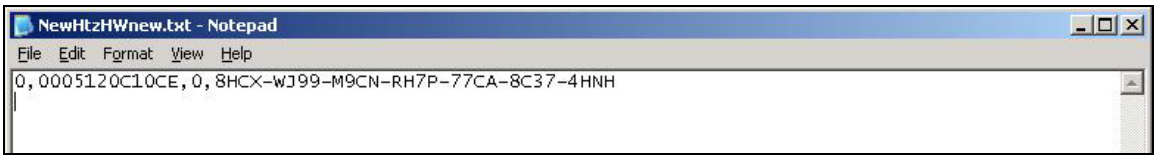
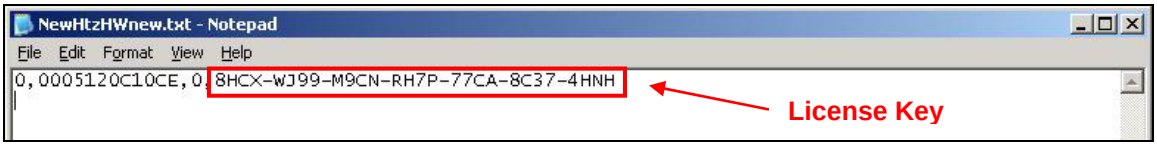


10

When enabling the **802.11 a** Radio and Mesh on a 4300-49 device. Select the 802.11 a Radio **Active** check box AND the **Mesh Enabled** check box.

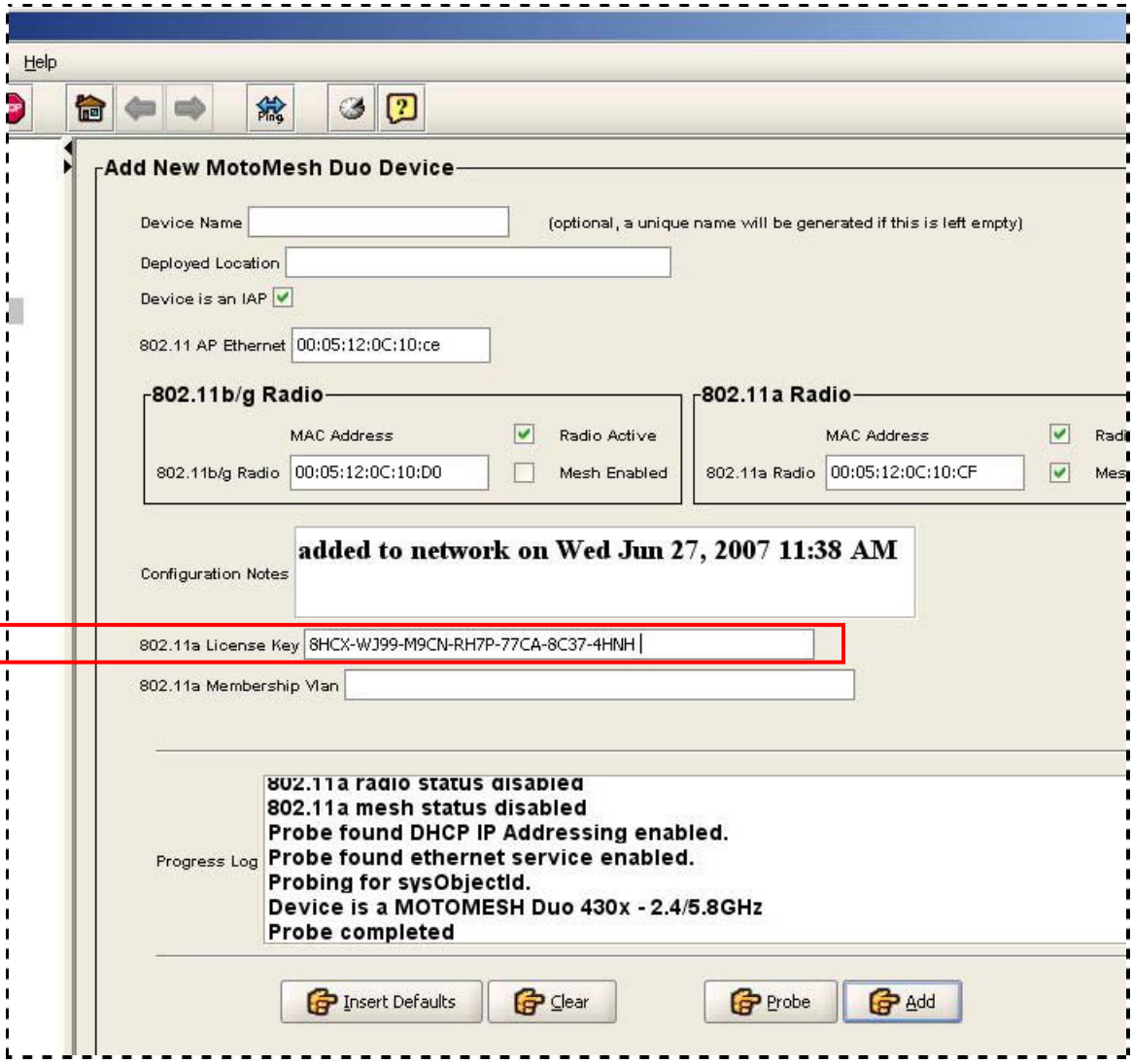
Figure 3-6 Enabling the *802.11 a* Radio on a 4300-49 Device



11	Minimize MeshManager temporarily as you will return to it shortly. There are still tasks that must be performed in MeshManager to complete the *Adding* and *Changing* of a New Device from an **802.11 b/g** Mesh into a **802.11 a** Mesh network.
12	Open the License Key text file that was provided with your MOTOMESH DUO 2.0 Product CDs. The file should be located on its own CD. Check with your sales representative for the exact file name. The file contents will look similar to the graphic below. If there are several devices to add to a (5.x) 802.11 **a** Mesh network, then several license keys may be listed in one License Key file. Note that each License Key is unique to a MAC Address. **Figure 3-7 An Example of a License Key Text File** 
13	Copy ONLY the License Key from the text file to the clipboard. Verify that you copying the correct License key by comparing the MAC Address listed after the first comma delimiter to the MAC Address of your device(s). **IMPORTANT NOTE**: DO NOT copy any extra characters or spaces from the front or back of the License key data. Any extra spaces in the License key can render the key unrecognizable by a device. **Figure 3-8 Copying the License Key from the Text File** 
14	Maximize the MeshManager Element System application.

15 Paste the previously copied License key into the **802.11a License Key** entry field in MeshManager.

Figure 3-9 Pasting the License Key into MeshManager



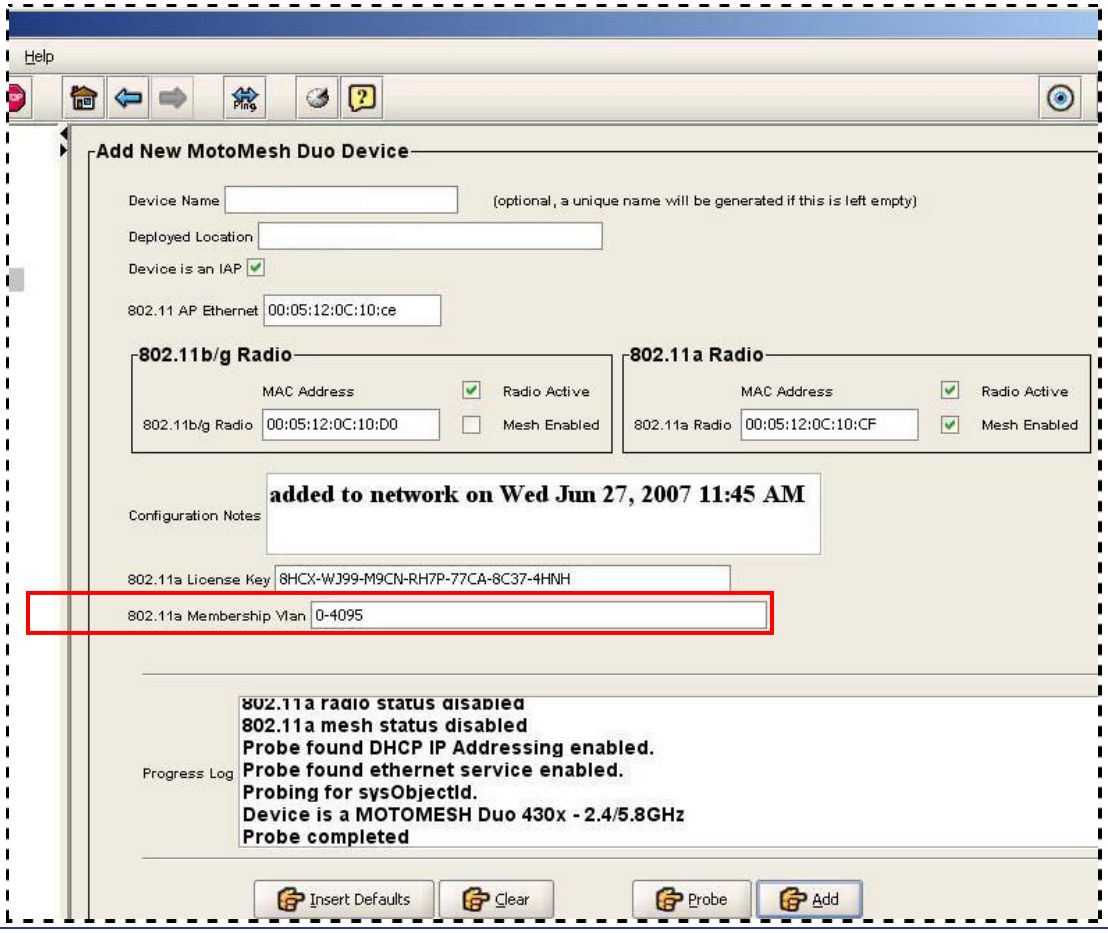
16

Configure the 802.11 a Membership VLAN by entering 0-4095 into the **802.11 a Membership VLAN** entry field.

IMPORTANT NOTE: The minimum requirement for this field is 4095, which is the initial designated Management VLAN.

IMPORTANT NOTE: If the NEW Device is to be a 2.4/4.9 Mesh, the **802.11 a Membership VLAN** entry field will become disabled. This is will eliminate the possibility of creating a network loop and VLAN overlap. Use the VLAN Configuration Tool after the device(s) have been added from MeshManager's **Tools | VLAN Configuration** menu.

Figure 3-10 Entering 802.11 a Membership VLAN Data



17

Decide if you want the device to be an IAP or an MWR on your network.

The **Device is an IAP** checkmark is ENABLED by Default. If you wish to Add a device to the Network as a MWR, simply uncheck the check box associated with this selection.

IMPORTANT NOTE: All MOTOMESH Duo 4300 devices are initially preconfigured as IAPs. If you wish to demote an IAP to a WR after it has been added to the Network, you can do so at a later time.

Figure 3-11 Configuring a Device to be an IAP or WR

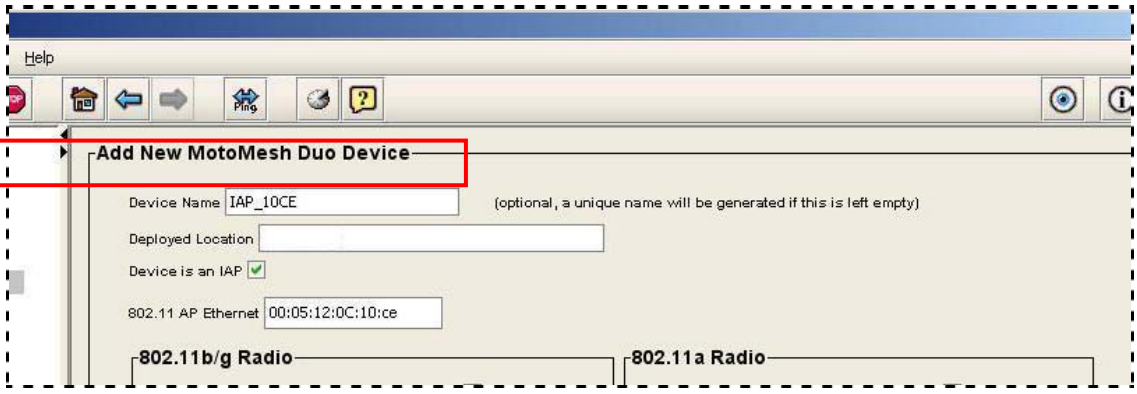
18

Enter a device name into the **Device Name** entry field. Follow your company's device network naming conventions.

IMPORTANT NOTE: No spaces are allowed when choosing a Device Name. Your entry must be a fully qualified Domain Name.

IMPORTANT NOTE: If a device name is not entered, MeshManager will generate a randomly unique name.

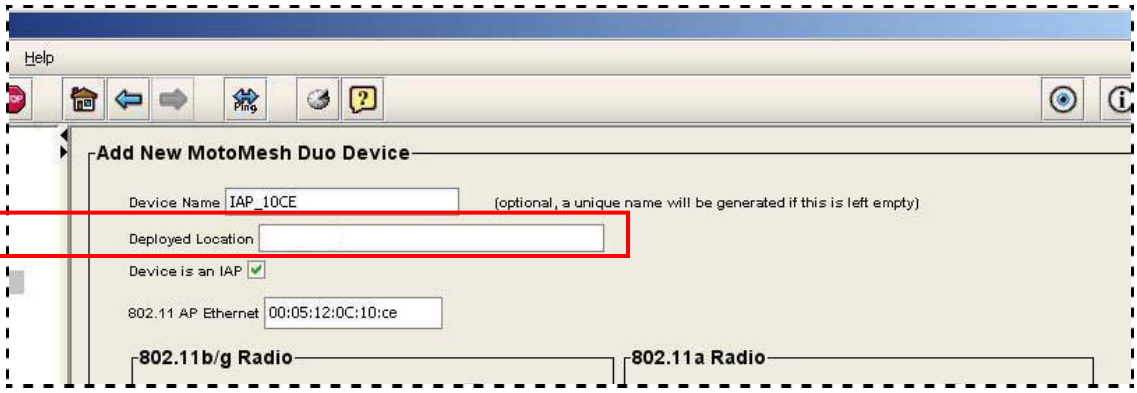
Figure 3-12 Entering a Device Name



19

Enter an optional deployed location description into the **Deployed Location** entry field. Follow your company's device network naming conventions.

Figure 3-13 Entering an Optional Deployed Location

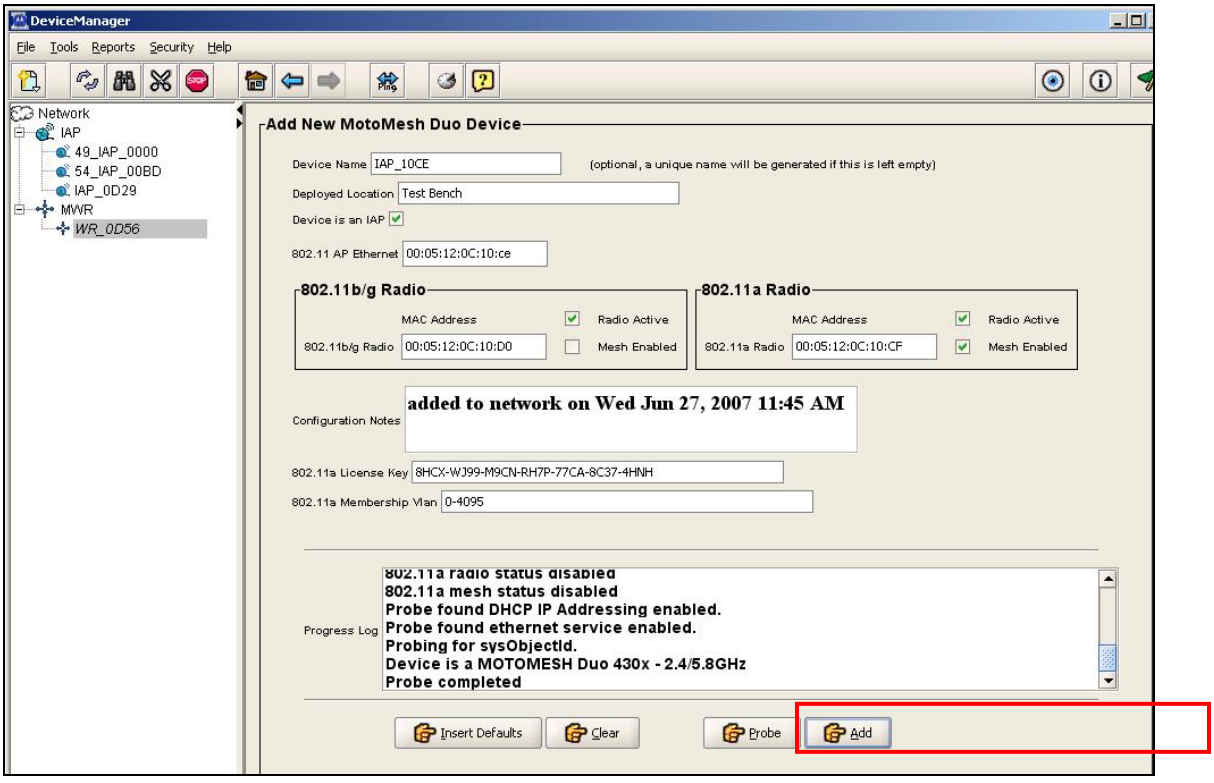


20

All of the Device configuration selections should now be completed.

Select the **Add** button to formally add the device to the Network.

Figure 3-14 Adding a Device to the Mesh

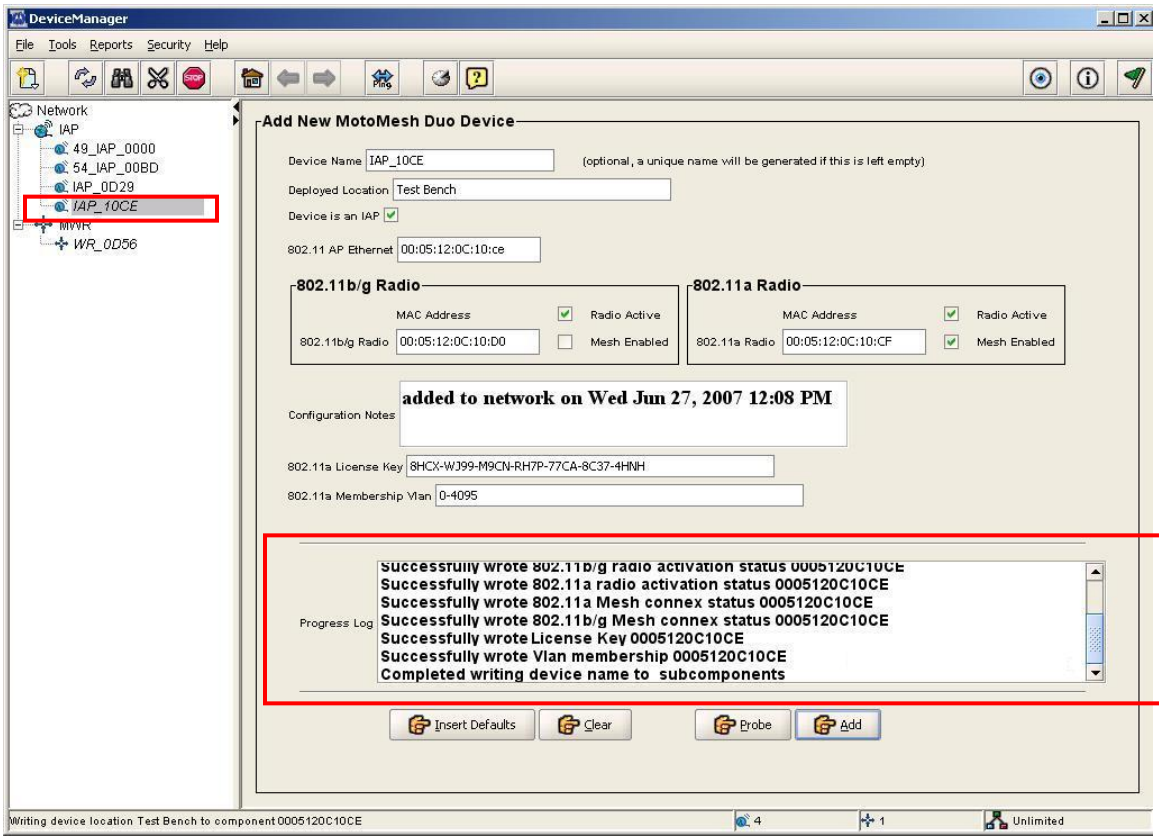


21

Observe the **Progress Log** for any errors.

Notice that the new device is now shown in the IAP group in the Device Tree in MeshManager.

Figure 3-15 After Adding a Device to the Mesh



22

To verify the new device configuration, select the **Probe** button again to re-probe the device.

IMPORTANT NOTE: If there are any errors at the time that a device is added, performing a *re-probe* will confirm a successful configuration.

23

A successfully configured device will display the same information in the entry fields and check boxes that were intended when configuring the device. Incorrectly displayed entry fields or check boxes will be a sign of a failed device configuration.

You can also check the progress log for the following characteristics:

- 802.11 a radio status enabled

- 802.11 a mesh status enabled

- Probe found DHCP IP addressing

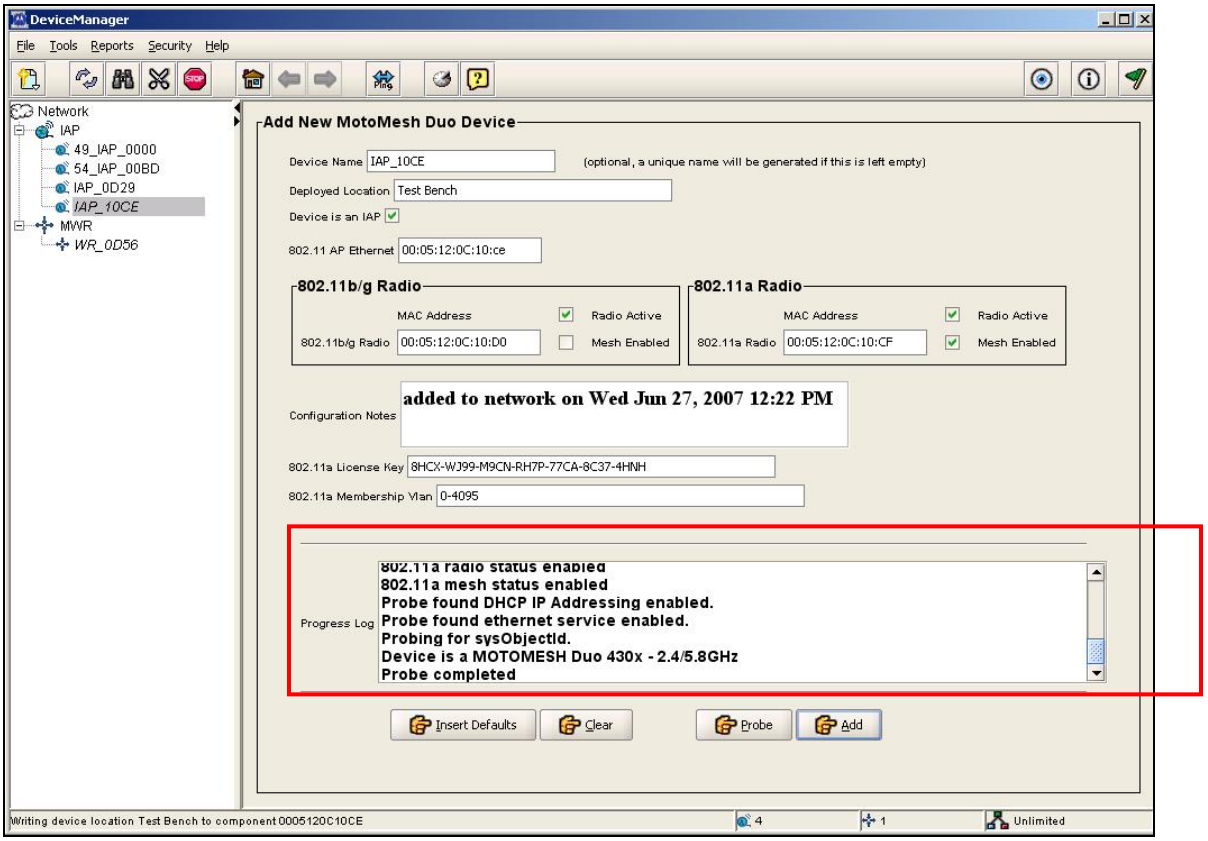
- Successfully wrote 802.11 a ….

- Successfully wrote License Key xxxxxxxxxx (newly added license key #)

- Successfully wrote VLAN Membership xxxxxxxxx (newly added license key #)

- Completed writing device name to subcomponents.

Figure 3-16 After Successfully Adding a Device to the Mesh



24

If any errors are detected, you should delete the device from the Device Tree and start over with the specific device.

To delete a device, right-click on it in MeshManager's Device Tree, and then select **Delete Device** from the pop-up menu.

25

End of Procedure.

Demoting an IAP Device to a MWR

The following is a step by step procedure that describes how to demote an existing IAP device to an MWR, and then promote it back to an IAP.

IMPORTANT

IMPORTANT NOTE: *Once a device is demoted to an MWR, you will no longer be able to communicate with the device through its Ethernet connection. It will need to route to an active IAP.*

IMPORTANT NOTE: *Careful consideration should be taken prior to demoting an IAP with respect to VLAN configurations. Precautions must be taken to prevent a loop condition from occurring in the network.*

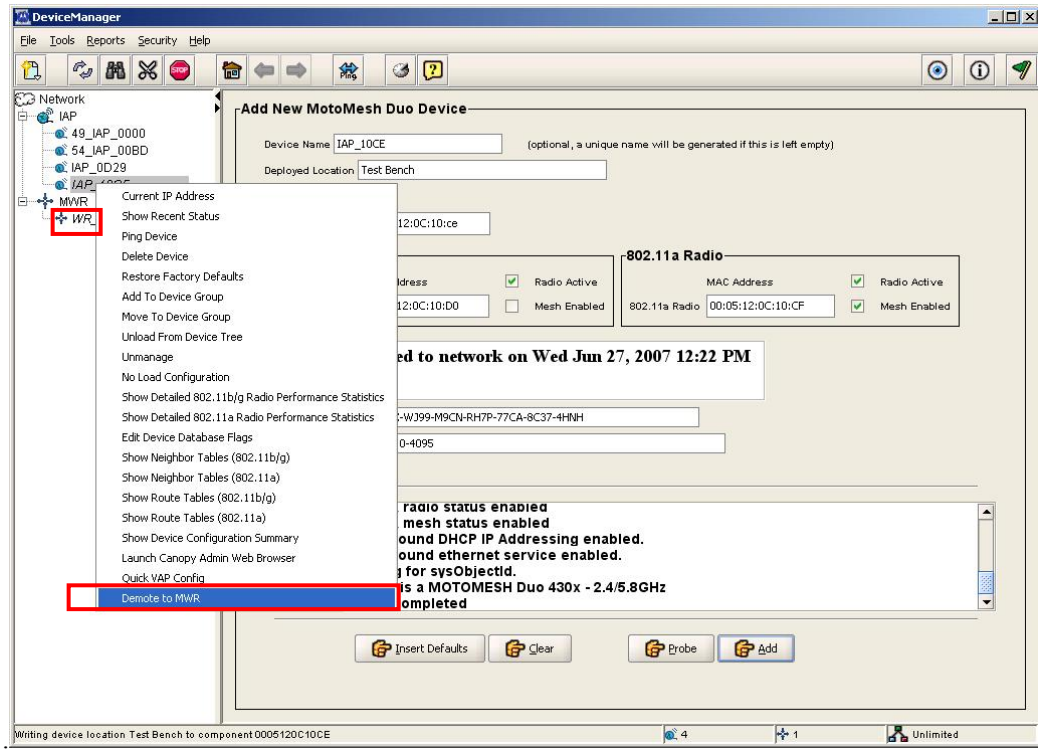
IMPORTANT NOTE: *When a device is demoted it will stop invoking its backhaul detection routines even if the device's Backhaul feature is enabled.*

IMPORTANT NOTE: *The demoted device will be re-started as part of the change.*

Procedure 3-2 Demoting an IAP to a MWR

1 Within MeshManager, right-click on the IAP device to be demoted and select **Demote to MWR**.

Figure 3-17 Selecting an IAP Device to be Demoted



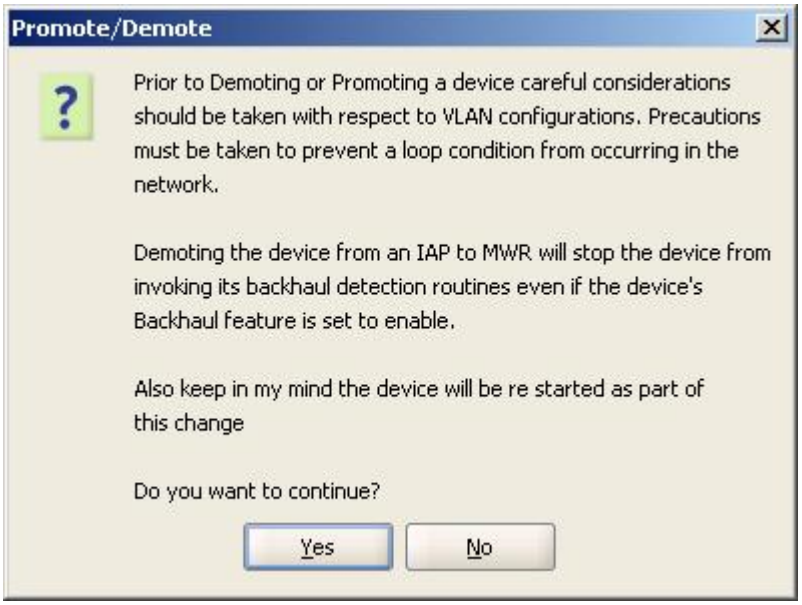
2 From the newly opened **Promote/Demote** dialog box, select **Yes** to continue demoting the device, or select **No**.

IMPORTANT NOTE: Careful consideration should be taken prior to demoting an IAP with respect to VLAN configurations. Precautions must be taken to prevent a loop condition from occurring in the network.

IMPORTANT NOTE: When a device is demoted it will stop invoking its backhaul detection routines even if the device's Backhaul feature is enabled.

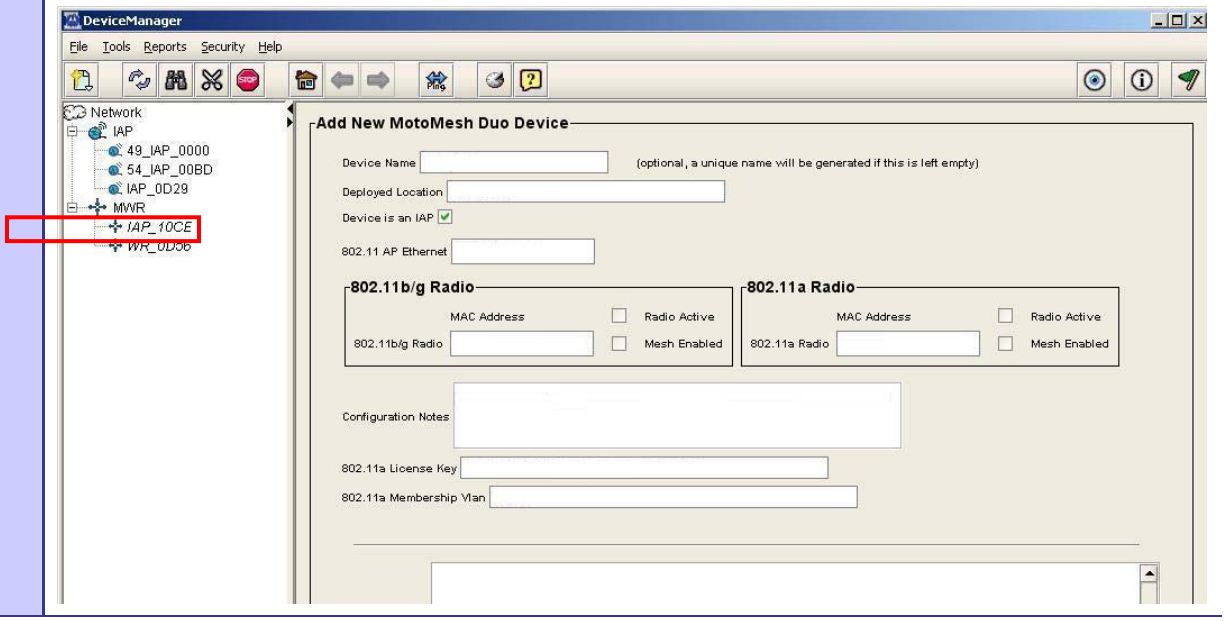
I**MPORTANT NOTE:** The demoted device will be re-started as part of the change.

Figure 3-18 Promote / Demote Dialog


Promote/Demote
Prior to Demoting or Promoting a device careful considerations should be taken with respect to VLAN configurations. Precautions must be taken to prevent a loop condition from occurring in the network.
Demoting the device from an IAP to MWR will stop the device from invoking its backhaul detection routines even if the device's Backhaul feature is set to enable.
Also keep in my mind the device will be re started as part of this change
Do you want to continue?
Yes
No

3 The successfully demoted IAP is now shown in the MWR group in MeshManager's Device Tree.

Figure 3-19 Demoted IAP Device shown moved into a MWR Group



4	To Promote the device back to an IAP, right-click on the device in the *Device Tree* and choose **Promote to an IAP** from the pop-up menu.
5	From the newly opened **Promote/Demote** dialog box, select **Yes** to continue promoting the device, or select **No**.
6	The device icon will be moved from the MWR group to the IAP group in MeshManager's Device Tree.

Second IP Stack Aids in Troubleshooting

The second IP Stack feature is available in MOTOMESH Duo 4300 devices and allows for a pre-configured SSID and connectivity to a fixed IP. This feature can assist you with correcting and diagnosing some cases of stranded units rather than having to roll a bucket truck. Operators will find this feature helpful when configuring nodes for expansion or replacement.

Second IP Stack Settings

A MOTOMESH Duo device can be accessed via an 802.11 b/g client access card (a PCMCIA Wireless Client Card) that is attached to a laptop computer. The client access card must be set to the settings specified in the *MeshManager Users Guide Device Recovery Configuration Tab* section to enable a successful connection.

VAP 15 information is to be used only for Second IP Stack data.

Accessing the MOTOMESH Duo Device Recovery Settings in MeshManager

Procedure 3-3 Accessing the MOTOMESH Duo Device Recovery Settings

1	Select a specific device from the *Device Tree* in MeshManager.
2	From the right side of the screen, select **Global Configuration** from the *Action* drop-down list.
3	Select the ***Device Recovery*** tab.
4	View the Default VAP 15 Settings setup for the purpose of device recovery.
5	You can choose to keep the default settings or change them after your wireless network is setup, configured, and working properly.

Device Recovery Settings

The MOTOMESH Duo *device recovery* default settings (VAP 15) have the following conditions:

- Authentication Type– WPA-AUTO-PSK
- Cipher Mode- AUTO
- Passphrase- blackd0g
- Static IP Address- 192.168.1.1
- IP network mask- 255.255.255.0
- SSID- MotoMesh
- SSID Suppression- On

If you change any of the default settings for VAP15, make sure that when it is time to recover your MOTOMESH Duo Device that the Client Access Card is set to match your current network settings for Device Recovery (VAP15).

Chapter

4

Chapter 4: License Information

This chapter includes the contents of the Motorola End User License Agreement (EULA) as well as a Third Party License section.

Motorola End User License Agreement

MOTOROLA, INC.

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5. CONFIDENTIALITY. You acknowledge that all Products contain valuable proprietary information and trade secrets and that unauthorized or improper use of the Products will result in irreparable harm to Motorola for which monetary damages would be inadequate and for which Motorola will be entitled to immediate injunctive relief. Accordingly, you will limit access to the Products to those of your employees and agents who need to use the Products for your internal business purposes, and you will take appropriate action with those employees and agents to preserve the confidentiality of the Products, using the same degree of care to avoid unauthorized or improper disclosure as you use for the protection of your own proprietary software, but in no event less than reasonable care.

Notwithstanding anything to the contrary herein, you shall have no obligation to preserve the confidentiality of any proprietary information that: (i) was in the public domain at the time of disclosure; (ii) entered the public domain through no fault of yours; (iii) was given to you free of any obligation to keep it confidential; (iv) is independently developed by you; or (v) is disclosed as required by law provided that you notify Motorola prior to such disclosure and provide Motorola with a reasonable opportunity to respond.

6. RIGHT TO USE MOTOROLA'S NAME. Except as required in Section 3.4 above, you shall not, during the term of this Agreement or thereafter, use any trademark, of Motorola, or any word or symbol likely to be confused with any Motorola trademark, either alone or in any combination with another word or words.

7. PAYMENT. The rights granted hereunder are contingent upon payment for the Products. All payments shall be due net thirty (30) days from date of the invoice.

8. UPGRADES AND UPDATES. If the Products are licensed to you as an upgrade or update to a product previously licensed to you, you must destroy the Products previously licensed to you, including any copies, within thirty (30) days of your receipt of the update or upgrade.

9. MAINTENANCE. Motorola shall not be responsible for maintenance or field service of the Software under this Agreement.

10. LIMITED WARRANTY. All diskettes or CD-ROMS on which the Products are furnished ("Media") are warranted to be free from manufacturing and material defects for ninety (90) days after the shipment date of the Products to you. Media that become defective during such period shall be repaired or, at Motorola's option, replaced. This limited warranty is contingent upon proper use of the Media and does not cover Products which have been tampered with, modified, or subjected to unusual physical or electrical stress. Tampering with or removal of any factory seal or label on any Media voids this warranty and releases Motorola from any and all liability.

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12. REMEDIES. The entire liability of Motorola, and your exclusive remedy under the warranty provided herein will be, at Motorola's option, to repair or replace any Media

found to be defective within the warranty period, or to refund the purchase price and terminate this Agreement. To seek such a remedy, you must return the entire Product to Motorola, with a copy of the original purchase receipt within the warranty period.

13. LIMITATION OF LIABILITY. THE TOTAL LIABILITY OF MOTOROLA UNDER THIS AGREEMENT FOR DAMAGES SHALL NOT EXCEED THE TOTAL AMOUNT PAID BY YOU FOR THE PRODUCTS LICENSED UNDER THIS AGREEMENT. IN NO EVENT WILL MOTOROLA BE LIABLE IN ANY WAY FOR INCIDENTAL, CONSEQUENTIAL, INDIRECT, SPECIAL OR PUNITIVE DAMAGES OF ANY NATURE, INCLUDING WITHOUT LIMITATION, LOST BUSINESS PROFITS, OR LIABILITY OR INJURY TO THIRD PERSONS, WHETHER FORESEEABLE OR NOT, REGARDLESS OF WHETHER MOTOROLA HAS BEEN ADVISED OF THE POSSIBLITY OF SUCH DAMAGES. Some jurisdictions do not permit limitations of liability for incidental or consequential damages, so the above exclusions may not apply to you.

14. U.S. GOVERNMENT. If you are acquiring the Products on behalf of any unit or agency of the U.S. Government, the following shall apply. Use, duplication or disclosure of the Products is subject to the restrictions set forth in subparagraphs (c)(1) and (2) of the Commercial Computer Software-Restricted Rights clause at FAR 52.227-19 (JUNE 1987), if applicable, unless being provided to the Department of Defense. If being provided to the Department of Defense, use, duplication, or disclosure of the Products is subject to the restricted rights set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.227-7013 (OCT 1988), if applicable. Software and Documentation may or may not include a Restricted Rights notice, or other notice referring specifically to the terms and conditions of this Agreement. The terms and conditions of this Agreement shall each continue to apply, but only to the extent that such terms and conditions are not inconsistent with the rights provided to you under the aforementioned provisions of the FAR or DFARS, as applicable to the particular procuring agency and procurement transaction."

15. TERM OF LICENSE. Your right to use the Products will begin when you click the "ACCEPT" button below, which constitutes acceptance of the terms and conditions herein, and will continue in perpetuity unless terminated as follows. Your right to use the Products will terminate immediately without notice upon a breach of this Agreement by you. Otherwise, this Agreement may be terminated by either party upon thirty (30) days prior written notice. Within thirty (30) days after termination of this Agreement, you will certify to Motorola in writing that through your best efforts, and to the best of your knowledge, the original and all copies, in whole or in part, in any form, of the Software and all related material and Documentation, have been destroyed, except that, with prior written consent from Motorola, you may retain one copy for archival or backup purposes. You may not sublicense, assign or transfer the license or the Products, except as expressly provided in this Agreement. Any attempt to otherwise sublicense, assign or transfer any of the rights, duties or obligations hereunder is null and void.

16. GOVERNING LAW. This Agreement shall be governed by the laws of the United States of America to the extent that they apply and otherwise by the laws of the State of Illinois.

17. ASSIGNMENT. This Agreement may not be assigned or otherwise transferred by you.

18. SURVIVAL OF PROVISIONS. The parties agree that where the context of any provision indicates an intent that it shall survive the term of this Agreement, then it shall survive.

19. ENTIRE AGREEMENT. This Agreement contains the parties' entire agreement regarding your use of the Products and may be amended only in writing signed by both parties, except that Motorola may modify this Agreement as necessary to comply with applicable laws and regulations including FCC regulations.

20. THIRD PARTY SOFTWARE. The Software may contain one or more items of Third-Party Software supplied by other third-party suppliers. The terms of this Agreement govern your use of any Third-Party Software UNLESS A SEPARATE THIRD-PARTY SOFTWARE LICENSE IS INCLUDED, IN WHICH CASE YOUR USE OF THE THIRD-PARTY SOFTWARE WILL THEN BE GOVERNED BY THE SEPARATE THIRD-PARTY LICENSE.

IF THE FOREGOING TERMS AND CONDITIONS ARE ACCEPTABLE TO YOU, PLEASE INDICATE YOUR AGREEMENT AND ACCEPTANCE BY CLICKING BELOW ON THE BUTTON LABELED "ACCEPT".

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Third Party Licensing Agreements

The following section lists the respective copyright owners and the associated license information for portions of Open Source code that may be included in Motorola's MOTOMESH Product line.

Hostapd - Copyright and License Information

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hostapd - user space IEEE 802.11 AP and IEEE 802.1X/WPA/WPA2/EAP
        Authenticator and RADIUS authentication server
=================================================================

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Chapter

5

Chapter 5: Customer Service

This chapter provides information about how to obtain customer service support from Motorola and describes the type of information you should have available prior to making the support call.

Customer Service Information

If you have read this document and made every effort to resolve installation or operation issues yourself and still require help, please contact your regional Motorola support representatives

USA

Motorola System Support Center (SSC) using the following contact information:

Phone: 800-221-7144

Hours of Operation: 7 days a week, 24 hours

Europe

Phone: +44 (0)1793 564680

Email: essc@motorola.com

Hours: Mon-Fri 09:00 - 17:00 GMT

Calls are logged 24 x 7, cases will be worked Mon-Fri 09:00 - 17:00 GMT

Asia and Pacific Region

Remote Technical Help Desk (Channel Partners)
Phone: +63 28 92 79 93
Email: wi4Tech@motorola.com
Hours of Operation: Mon - Fri 8 am - 6 pm
Sat 8 am - 12 noon

Obtaining Support

Motorola provides technical support services for your system and recommends that you coordinate warranty and repair activities through the Motorola System Support Center (SSC). When you consult the Motorola SSC, you increase the likelihood that problems are rectified in a timely fashion and that warranty requirements are satisfied. Check your contract for specific warranty and service information.

System Information

To be provided with the best possible opportunity for support, collect the following system information and have it available when obtaining support.

- Location of the system
- Date the system was put into service
- Software or firmware version information for components of your system
- Serial number(s) of the device(s) or component(s) requiring support
- A written description of the symptom or observation of the problem:

  - When did it first appear?

  - Can it be reproduced?

  - What is the step-by-step procedure to cause it?
- Do other circumstances contribute to the problem? For example, changes in weather or other conditions?
- Maintenance action preceding problem:

  - Upgrade of software or equipment

  - Change in the hardware or software configuration

  - Software reload - from backup or from CD-ROM (note the version and date)

Return Material Request

After collecting system information, contact the Motorola System Support Center for assistance or to obtain a Return Material Authorization (RMA) number for faulty Field Replaceable Entities (FREs):

North America: 800-221-7144

Radio Products and Services Division

The Radio Products and Services Division is your source for manuals and replacement parts.

Radio Products and Services Division Telephone Numbers

The telephone numbers for ordering are: (800)-422-4210 (US and Canada orders)

The fax numbers are: (800)-622–6210 (US and Canada orders)

The number for help identifying an item or part number is (800)-422-4210; select choice “3” from the menu

Returning System Components to Motorola

Motorola's service philosophy is based on field replaceable entities (FREs). FREs are system components identified by Motorola to be returned to Motorola for repair.

Returning FREs

Return faulty FREs to Motorola for repair. When you return an assembly for service, follow these best practices:

- Place any assembly containing CMOS devices in a static-proof bag or container for shipment.
- Obtain a return authorization (RA) number from the Motorola System Support Center.
- Include the warranty, model, kit numbers, and serial numbers on the job ticket, as necessary.
- If the warranty is out of date, you must have a purchase order.
- Print the return address clearly, in block letters.
- Provide a phone number where your repair technician can be reached.
- Include the contact person's name for return.
- Pack the assembly tightly and securely, preferably in its original shipping container.

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Chapter

6

Chapter 6: Certification and Safety Information

This chapter lists the relevant FCC Certification and Product Safety Information for the MOTOMESH devices described in this manual.

FCC Regulatory Information

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received; including interference that may cause undesired operation.

The IAP (Intelligent Access Point) is an infrastructure device that is positioned at a fixed location such as a building rooftop.

The MWR (Mesh Wireless Router) is an infrastructure device positioned in a fixed location, such as on a pole, wall, or rooftop. The MWR requires professional installation to ensure the installation is performed in accordance with FCC licensing regulations.

Federal Communications Commission (FCC) Statement

Intelligent Access Point/Mesh Wireless Router

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Safety Information for the MOTOMESH Products

The Federal Communications Commission (FCC) with its action in ET Docket 96-8 has adopted a safety standard for human exposure to radio frequency (RF) electromagnetic energy emitted by FCC certified equipment. Motorola MOTOMESH products meet the uncontrolled environmental limits found in OET-65 and ANSI C95.1, 1991. Proper operation of this radio according to the instructions found in this manual and the hardware and software guides on the MOTOMESH CD will result in user exposure that is substantially below the FCC recommended limits.

- Do not touch or move the antenna(s) while the unit is transmitting or receiving.
- Do not hold any component containing a radio such that the antenna is very close to or touching any exposed parts of the body, especially the face or eyes, while transmitting.
- Do not operate a portable transmitter near unshielded blasting caps or in an explosive environment unless it is a type especially qualified for such use.
- Do not operate the radio or attempt to transmit data unless the antenna is connected; otherwise, the radio may be damaged.

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 2 meters between the radiator and your body.

Safety Certification

Conforms to UL STD ANSI/UL 60950 3rd Edition

- Certified to CAN/CSA C22.2 NO. 60950-00

Equipment shall be suitable for use in Air pressure: 86kPa to106kPa.

Regulatory Requirements for CEPT Member States

When operated in accordance with the instructions for use, MOTOMESH Wireless equipment operating in the 2.4 GHz band is compliant with CEPT Recommendation 70-03 Annex 3 for Wideband Data Transmission and HIPERLANs. For compliant operation in the 2.4 GHz band, the transmit power (EIRP) from the built-in patch antenna and any associated reflector dish shall be no more than 100mW (20dBm).

(http://www.cept.org)

The following countries have completely implemented CEPT Recommendation 70-03 Annex 3A (2.4 GHz band):

- EU & EFTA countries**:** Austria, Belgium, Denmark, Spain, Finland, Germany, Greece, Iceland, Italy, Ireland, Liechtenstein, Luxembourg, Netherlands, Norway, Portugal, Switzerland, Sweden, UK
- New EU member states**:** Czech Republic, Cyprus, Estonia, Hungary, Lithuania, Latvia, Malta, Poland, Slovenia, Slovakia
- Other non-EU & EFTA countries: Bulgaria, Bosnia and Herzegovina, Turkey

The following countries have a limited implementation of CEPT Recommendation 70-03

Annex 3A:

- France - Outdoor operation at 100mW is only permitted in the frequency band 2400 to 2454 MHz;
    - Any outdoor operation in the band 2454 to 2483.5MHz shall not exceed 10mW (10dBm);
    - Indoor operation at 100mW (20dBm) is permitted across the band 2400 to 2483.5 MHz
- French Overseas Territories:
    - Guadeloupe, Martinique, St Pierre et Miquelon, Mayotte – 100mW indoor & outdoor is allowed
    - Réunion and Guyana – 100mW indoor, no operation outdoor in the band 2400 to 2420MHz
- Italy - If used outside own premises, general authorization required
- Luxembourg - General authorization required for public service
- Romania - Individual license required. T/R 22-06 not implemented

Motorola MOTOMESH Radios operating in the 2400 to 2483.5MHz band and 5470 to 5725 MHz band are categorized as “Class 2” devices within the EU and are marked with the class identifier symbol, denoting that national restrictions apply (for example, France). The French restriction in the 2.4 GHz band will be removed in 2011. Users are advised to contact their national administrations for the current status on the implementation of ECC DEC(04)08 for the 5.4GHz band.

This equipment is “CE” marked to show compliance with the European Radio & Telecommunications Terminal Equipment (R&TTE) directive 1999/5/EC. Contact Motorola for a copy of the Declaration of Conformity.

MOTOROLA INC
1303 E ALGONQUIN ROAD
SCHAUMBURG IL 60196
UNITED STATES

Where necessary, the end user is responsible for obtaining any National licenses required to operate this product and these must be obtained before using the product in any particular country. However, for CEPT member states, 2.4 GHz Wideband Data Transmission equipment has been designated exempt from individual licensing under decision ERC/DEC(01)07. For EU member states, RLAN equipment in both the 2.4 & 5.4GHz bands is exempt from individual licensing under Commission Recommendation 2003/203/EC. Contact the appropriate national administrations for details on the conditions of use for the bands in question and any exceptions that might apply. Also see http://www.ero.dk for further information.

European Union Notification

The CE mark is the official marking required by the European Community for all Electric and Electronic equipment that will be sold, or put into service for the first time, anywhere in the European community. It proves to the buyer or user that this product fulfills all essential safety and environmental requirements as they are defined in the European Directives.

CE

Motorola Products are covered under the following product certification Europe:

ETSI EN 300 328 V 141 (2003-04)

ETSI EN 301 489-1 (2002-08) and 301 489-17

EN 55022:1998 and EN 55024:1998

CENELEC EN 50360 and EN50371 – Specific Absorption Test – SAR

The following countries are covered under the CE Mark:

Austria, Belgium, Demark, Finland, Germany, Greece, Ireland, Italy, Luxemburg, Netherlands, Portugal, Spain, Sweden, UK

The CE mark acknowledges that the product is in compliance with regulations of the European Radio & Telecommunications Terminal Equipment (R&TTE) directive 1999/5/EC and can be operated in the

European Economic Area (EEA). Some countries may require a declaration of conformity, check with your Motorola sales team for details.

Belgium Notification

Belgium national restrictions in the 2.4 GHz band include

- EIRP must be lower than 100 mW
- For crossing the public domain over a distance > 300m the user must have the authorization of the BIPT.
- No duplex working

Luxembourg Notification

For the 2.4 GHz band, point-to-point or point-to-multipoint operation is only allowed on campus areas.

Czech Republic Notification

2.4 GHz products can be operated in accordance with the Czech General License No.

GL 12/R/2000.

Equipment Disposal

Waste (Disposal) of your Electronic and Electric Equipment

Please do not dispose of Electronic and Electric Equipment or Electronic and Electric Accessories with your household waste. In some countries or regions, collection systems have been set up to handle waste of electrical and electronic equipment. In European Union countries, please contact your local equipment supplier representative or service centre for information about the waste collection system in your country.

EU Declaration of Conformity for RoHS Compliance

The following table lists the citations from European Union member nations for the Declaration of Conformity for the Restriction of the use of certain Hazardous Substances (RoHS) in electrical and electronic equipment for the Motorola products listed.

Česky [Czech]	Motorola timto prohlašuje, že tento *Motorola MOTOMESH* ***4300-xx*** *series,* je ve shodě se základními požadavky a dalšimi přislušnými ustanoveními směrnice 1999/5/ES.
Dansk [Danish]	Undertegnede Motorola erklærer herved, at følgende udstyr *Motorola MOTOMESH* ***4300-xx*** *series,* overholder de væsentlige krav og øvrige relevante krav i direktiv 1999-5-EF.
Nederlands [Dutch]	Hierbij verklaart Motorola dat het toestel *Motorola MOTOMESH* ***4300-xx*** *series,* in overeenstemming is met de essentiele eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.
	Bij deze verklaart Motorola dat deze *Motorola MOTOMESH* ***4300-xx*** *series,* voldoet aan de essentiele eisen en aan de overige relevante bepalingen van Richtlijn 1999-5-EC.
English	Hereby, Motorola, declares that this *Motorola MOTOMESH* ***4300-xx*** *series* is in compliance with the essential requirements and other relevant provisions of directive 1999/5/EC.
Eesti [Estonian]	Käesolevaga kinnitab lblotorola seadme *Motorola MOTOMESH* ***4300-xx*** *series,* vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
Suomi [Finnish]	Motorola vakuuttaa täten että *Motorola MOTOMESH* ***4300-xx*** *series,* tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
Français [French]	Par la présente Motorola déclare que l'appareil *Motorola MOTOMESH* ***4300-xx*** *series,* est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.
	Par la présente, Motorola déclare que ce *Motorola Canopy* ***5430BHxzz*** *series,* est conforme aux exigences essentielles et aux autres dispositions de la directive 1999/5/CE qui lui sont applicables.
Deutsch [German]	Hiermit erklärt Motorola, dass sich diese *Motorola MOTOMESH* ***4300-xx*** *series,* in Übereinstimmung mit den grundlegenden Anforderungen und den anderen relevanten Vorschriften der Richtlinie 1999/5/EG befindet. (BMWi)
	Hiermit erklärt Motorola die Übereinstimmung des Gerätes *Motorola MOTOMESH* ***4300-xx*** *series,* mit den grundlegenden Anforderungen und den anderen relevanten Festlegungen der Richtlinie 1999/5/EG. (Wien)
Ελληνικη [Greek]	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ Motorola *ΔΗΛΩΝΕΙ ΟΤΙ Motorola MOTOMESH* ***4300-xx*** *series,* ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣΖ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ.
Magyar [Hungarian]	Alulirott Motorola nyilatkozom, hogy a *Motorola MOTOMESH* ***4300-xx*** *series,* megfelel a vonatkozó alapető követelményeknek és az 1999/5/EC irányelv egyéb előirásainak.
Islenska [Icelandic]	Her með llysir Motorola yfir þvi að *Motorola MOTOMESH* ***4300-xx*** *series*, er i samæmi við grunnkröfur og aðar kröfur, sem gerðar eru i tilskipun 1999/5/EC.
Italiano [Italian]	Con la presente Motorola dichiara che questo *Motorola MOTOMESH* ***4300-xx*** *series*,

	è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla directiva 1999/5/CE.
Latviski [Latvian]	Ar šo Motorola deklarē, ka Motorola *MOTOMESH* ***4300-xx*** *series*, atbilst Direktīvas 1999/5/EK būtiskajām prasībām ūn citiem ar to saistītajiem noteikumiem.
Lietuviu [Lithuanian]	Šiuo Motorola deklaruoja, kad šis *Motorola MOTOMESH* ***4300-xx*** *series,* atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.
Malti [Maltese]	Hawnhekk, Motorola, jiddikjara li dan *Motorola MOTOMESH* ***4300-xx*** *series*, jikkonforma mal-htigijiet essenzjali u ma provvedimenti ohrajn relevanti li hemm fid-Dirrettiva 1999/5/EC.
Norsk [Norwegian]	Motorola erklærer herved at utstyret *Motorola MOTOMESH* ***4300-xx*** *series*, er i samsvar med de grunnleggende krav og øvrige relevante krav i direktiv 1999/5/EF.
Slovensky [Slovak]	Motorola týmto vyhlasuje že *Motorola MOTOMESH* ***4300-xx*** *series*, spľňa základné požiadavky a všetky prislušné ustanovenia Smernice 1999/5/ES.
Slovensko [Slovenian]	Motorola izjavlja, da je ta *Motorola MOTOMESH* ***4300-xx*** *series,* v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili directive 1999/5/ES.
Svenska [Swedish]	Härmed intygar Motorola att denna *Motorola MOTOMESH* ***4300-xx*** *series*, stär l överensstämmelse de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgär av direktiv 1999/5/EG.
Espanol [Spanish]	Por medio de la presente Motorola declara que el *Motorola MOTOMESH* ***4300-xx*** *series*, cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.
Polski [Polish]	Niniejszym, firma Motorola oswiadcza, ze produkt serii *Motorola MOTOMESH* ***4300-xx*** *series*, spelnia zasadnicze wymagania i inne istotne postanowienia Dyrektywy 1999/5/EC.
Portugues [Portuguese]	Motorola declara que este Motorola *MOTOMESH* ***4300-xx*** series, esta conforme com os requisitos essenciais e outras disposiçoes da Directiva 1999/5/CE.

CMM Labeling and Disclosure Table

The People's Republic of China require that our products comply with China Management Methods (CMM) environmental regulations. (China Management Methods refers to the regulation *Management Methods for Controlling Pollution by Electronic Information Products* Two items are used to demonstrate compliance; the Label and Disclosure Table.

The label is placed in a customer visible position on the product. The first of the following examples means that the product contains no hazardous substances; the second means that the product contains hazardous substances, and has an Environmental Friendly Use Period (EFUP) of fifty years.

Logo 1 Logo 2

The Environmental Friendly Use Period (EFUP) is the period (in years) during which the Toxic and Hazardous substances (T&HS) contained in the Electronic Information Product (EIP) will not leak or mutate causing environmental pollution, or bodily injury from use of the EIP.

The Disclosure Table, printed in simple Mandarin, is included with each customer order. An example of the Disclosure Table follows, in both Mandarin and English.

部件名称 (Parts)	有毒有害物质或元素 (Hazardous Substance)					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr^{6+})	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
金属部件 (Metal Parts)	×	○	○	×	○	○
电路模块 (Circuit Modules)	×	○	○	×	○	○
电缆及电缆组件 (Cables & Cable Assemblies)	×	○	×	×	○	○
塑料和聚合物部件 (Plastic and Polymeric parts)	○	○	○	○	○	×

○： 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。
Indicates that the concentration of the hazardous substance in all homogeneous materials in the parts is below the relevant threshold of the SJ/T11363-2006 standard.

×： 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T11363-2006标准规定的限量要求。
Indicates that the concentration of the hazardous substance of at least one of all homogeneous materials in the parts is above the relevant threshold of the SJ/T11363-2006 standard.

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Glossary

EDCF – Enhanced Distributed Coordination Function

EMS – Element Management System

IAP – Intelligent Access Point

MiSC – Mobile Internet Switching Controller

MWR– Mesh Wireless Router

POE – Power over the Ethernet, optional feature. Two types of PoE are currently supported on the MOTOMESH Duo 4300 device. It is the standards based 802.3af PoE or the Canopy Connect PoE. Only one type of PoE is available at any one time, if this optional feature is purchased, otherwise PoE is not enabled.

TFTP - Trivial File Transfer Protocol. A network utility that is simpler to use than the File Transfer Protocol (FTP).

WR – Wireless Router (same as MWR)

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